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Web Support for the Carbon Reduction Partnership in Kingston

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Web Support for the Carbon Reduction Partnership in the Royal Borough of Kingston

An Interactive Qualifying Project submitted to the faculty of Worcester Polytechnic Institute in partial fulfillment of the requirements for the Degree of Bachelor of Science

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Abstract

The Royal Borough of Kingston, one of thirty-two boroughs in the city of London, is developi ng a Carbon Reduction Partnership to meet both short and long term CO_2 emission goals. Our team provided the partnership with a website that facilitates networking on energy and climate change actions and allows partners to monitor progress in reducing carbon emissions. To support the development of the partnership, the team also identified characteristics critical for the formation, organization and best practice of successful partnerships.

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Executive Summary

The Royal Borough of Kingston (RBK) is developing a Carbon Reduction Partnership to meet both local and national carbon reduction targets. The team created a website for the upcoming partnership that allows partners to collaborate on emission lowering projects while also tracking monthly CO_2 emissions. The tracking tool is designed to provide the Borough with the necessary information required to meet the goals set forth by the United Kingdom through National Indicators 185 and 186.

In addition to the website, the team produced a set of recommendations regarding the formation, structure, and operation of successful partnerships. These recommendations include:

1. Regular meetings should be held monthly or quarterly and arranged through the website in order to keep partners engaged in the partnership.
2. Supplemental emails and newsletters should be sent on a weekly or bi-monthly basis.
3. Free incentives, such as carbon emission audits, should be utilized to encourage more organizations to join and participate in the partnership.
4. The economic benefits of reducing energy consumption should be made clear to the partners. Monetary gain is the best approach to attracting new partners.
5. A group of core partners should be used to set standards, supply useful information, and lead by example.
6. At least one member of staff should be employed whose sole duty is to develop and maintain the partnership.

These recommendations will help the RBK's Climate Change and Sustainable Travel officers develop a well-structured and successful Carbon Reduction Partnership.

Interviews with the Climate Change and Sustainable Travel officers identified critical components of the website. Figure 1 depicts a site map of these components. The officers emphasized that the energy and emission data provided by the partners must be kept private, which led the team to develop a password-protected login page and account request form for the website.

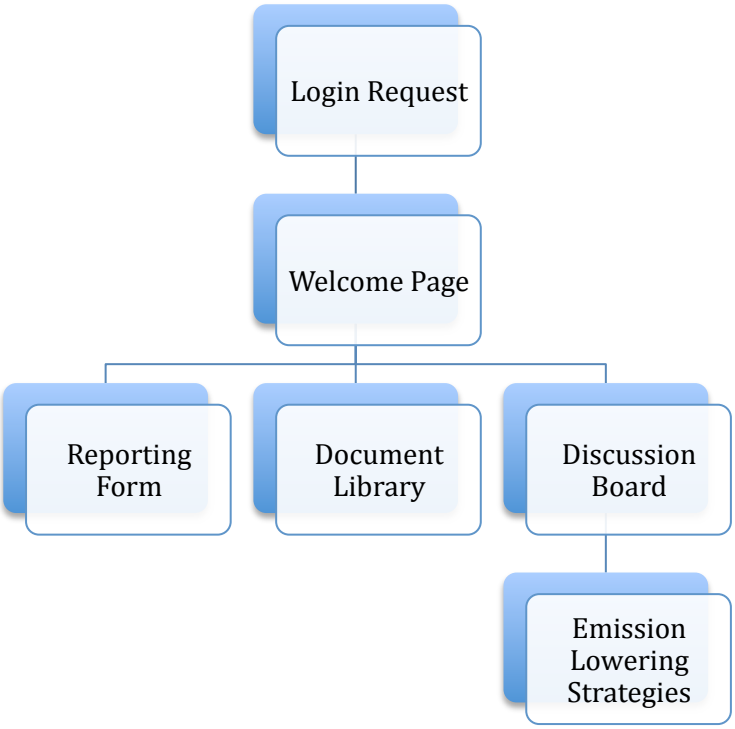


Figure 1: Site Map

After logging in, users come to a welcome page. Figure 2 shows a screenshot of the welcome page. The page includes a set of guidelines that instruct the partners on how to use each component of the website. Below the guidelines are links to discussion board threads where partners discuss cost efficient emission lowering techniques. Furthermore, a line graph depicts the Borough's total CO_2 emissions. It is automatically updated each month based on the partners' monthly reports of their energy usag

Welcome

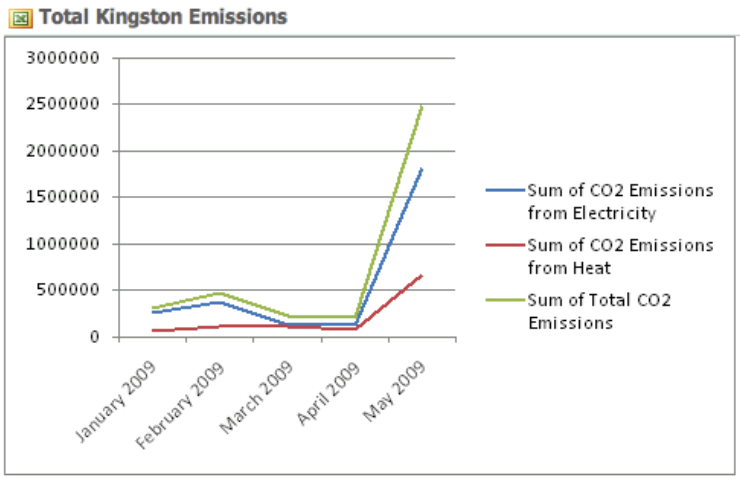
Welcome to the Carbon Reduction Partnership website. This tool will help you lower carbon emissions and help save the world. Global warming is a serious problem and together we will help reverse its effects. The Royal Borough of Kingston and the United Kingdom are beginning to require the reduction of carbon emissions and by using this tool you will ensure that money will be saved and guidelines are met.

Carbon Reduction Targets for the Royal Borough of Kingston			
Year	2008	2009	2010
Required Emission Reduction	2.5%	2.5%	5.0%

Guidelines

Below you can find **Graphical Data** regarding the overall progress of the Carbon Reduction Partnership. Data on each partner remains confidential and in no way can the graph be used to determine each partner's emissions.

- The **Partner List** link in the upper left displays links to each partners personal emission page. Partners can only view their own emission page.
- Energy usage should be added to the **Reporting Form** on the first of every month.
- Members can discuss topics regarding carbon emissions and find cost effective carbon reduction techniques on the **Discussion Board**.
- To review important documents regarding carbon emissions follow the link titled **Document Library**.



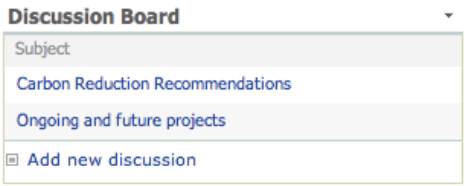


Figure 2: Welcome Page

The partners enter data into a reporting form displayed in Figure 3. The heat and electricity values from meter readings are automatically converted from kilowatt-hours into kilograms of CO_2, based on conversion factors from the Department for Environment, Food and Rural Affairs (DEFRA). The input and emission data is automatically added to a database that can be accessed by the Climate Change and Sustainable Travel officers.

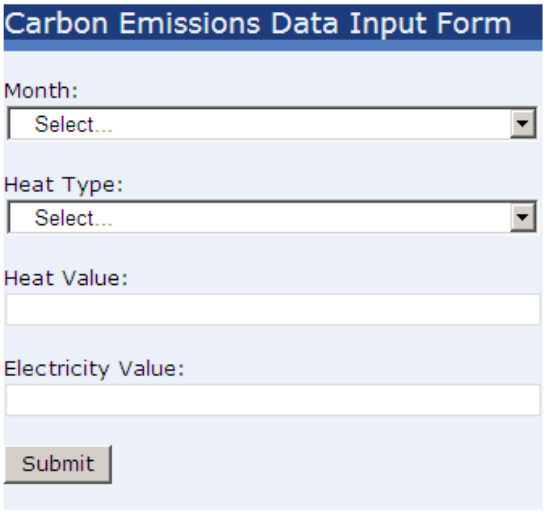


Figure 3: Carbon Emissions Data Input Form

In addition to the reporting form, the team implemented a document library and discussion board. The document library is a place where the CCST officers and partners can post and view government regulations and best practice policies provided by environmental agencies. This feature helps keep every partner up-to-date on current reduction techniques. The discussion forum provides the partners an opportunity to discuss successful projects and share them with partners having difficulty implementing projects.

The team developed the website to meet the standards established by the United Kingdom and the Royal Borough of Kingston. The Climate Change and Sustainable Travel officers are the primary developers of the Carbon Reduction Partnership and required the web-based communication and reporting tool to be in place before the official launch of the partnership. The communication tool is necessary for the partners to network on their carbon reduction activities. To ensure the council complies with its environmental policy, the reporting tool is able to track monthly carbon emission data throughout the borough. With the use of the website and recommendations, the Carbon

Reduction Partnership will be in a position to meet and potentially exceed its stated standards.

1 Introduction

In the last two hundred years, humans have relied heavily on fossil fuels for the majority of their energy needs. Only in recent years has the scientific community come to a consensus concerning the repercussions of using fossil fuels as the primary energy source. The burning of fossil fuels has released enormous amounts of greenhouse gases into the atmosphere and led to a substantial increase in the Earth's average surface temperature. For example, "Eleven of the last twelve years (1995-2006) rank among the twelve warmest years in the instrumental record of global surface temperature (since 1850)" (Bernstein et al., 2007). The temperature increases have already resulted in substantial melting of the polar icecaps, rising sea levels, and irregular weather patterns. Future increases are predicted to have substantial adverse impacts on the ecology, economy, and population of the world.

In order to counteract global warming, organizations worldwide, including the United Nations and the Intergovernmental Panel of Climate Change (IPCC), have laid out plans to decrease greenhouse gas emissions. Many countries have agreed to implement programs, such as the Kyoto Protocol and Agenda 21, which encourage the reduction of carbon emissions. However, to ensure the effectiveness of these programs, the focus of efforts must be at the local level. Consequently, many boroughs throughout London have created a range of policies and programs to reduce greenhouse gas emissions.

Local Strategic Partnerships (LSPs) have become common institutional arrangements that help coordinate such efforts among various local organizations. The Royal Borough of Kingston, one of thirty-two boroughs in London, has been developing an Energy Strategy that provides guidance for reducing carbon emissions. In order to meet the goals set forth in the Borough's Local Area Agreement, Kingston is forming a Carbon Reduction Partnership to coordinate efforts between the public and private sectors.

As the partnership was only just beginning to form, the project team had a golden opportunity to identify the components of a successful partnership and provide the Carbon Reduction Partnership with a functional website that could act as a communication device as well as a reporting tool. This website was created by applying information gathered in completing background research and through extensive

interviews conducted with members of Kingston's Climate Change and Sustainable Travel (CCST) group, organizations identified as potential partners, and with people who have experience with similar partnerships in other London Boroughs. CCST officers indentified a login screen, and provided carbon reduction recommendations as important website features. Interviews with potential partners yielded that a discussion board and an area for useful case studies. Informants involved in similar partnerships indicated that a reporting feature would be helpful to track the progress being made by the partnership.

Information regarding the complexities and best practice of these partnerships was also obtained through interviews. Based on these findings, the team created a series of recommendations including:

- A member of staff should be employed whose sole duty is to develop and maintain the partnership.
- The website should be used as a supplement to regular meetings.
- Free incentives, such as audits, should be used to encourage organizations to join and participate in the partnership.

By supporting a set of committed partners, the website and recommendations will assist the upcoming Carbon Reduction Partnership in meeting the Royal Borough of Kingston's ambitious carbon reduction targets.

2 Background

2.1 Global Warming

Most members of the scientific community agree that global warming is a serious problem and that human actions are the primary cause. A survey developed by Dr. Peter Doran from the University of Illinois, found that 96.5% of climatologists believe that Earth's average surface temperature is rising and 97.4% believe that the rise in temperature is due to anthropogenic effects (Doran2009). As outlined in the Intergovernmental Panel on Climate Change (IPCC), the "global average surface temperature" has increased by approximately 0.4 degrees Celsius over the past thirty years (Bernstein, et. al. 2007). The primary anthropogenic cause of global warming is the emission of greenhouse gases (GHG), including carbon dioxide, methane, and nitrous oxide (Department for Energy and Climate Change 2007). The accumulation of greenhouse gases in the atmosphere equates to an increase in trapped solar radiation due to the absorptive qualities of carbon molecules, which increases the average temperature on the surface of the Earth (Houghton, John 2004).

According to the fourth assessment report (AR4) from the IPCC and as illustrated in Figure 4, "carbon dioxide is the most important anthropogenic greenhouse gas. Its annual emissions grew by about 80% between 1970 and 2004" (Bernstein, et. al. 2007).

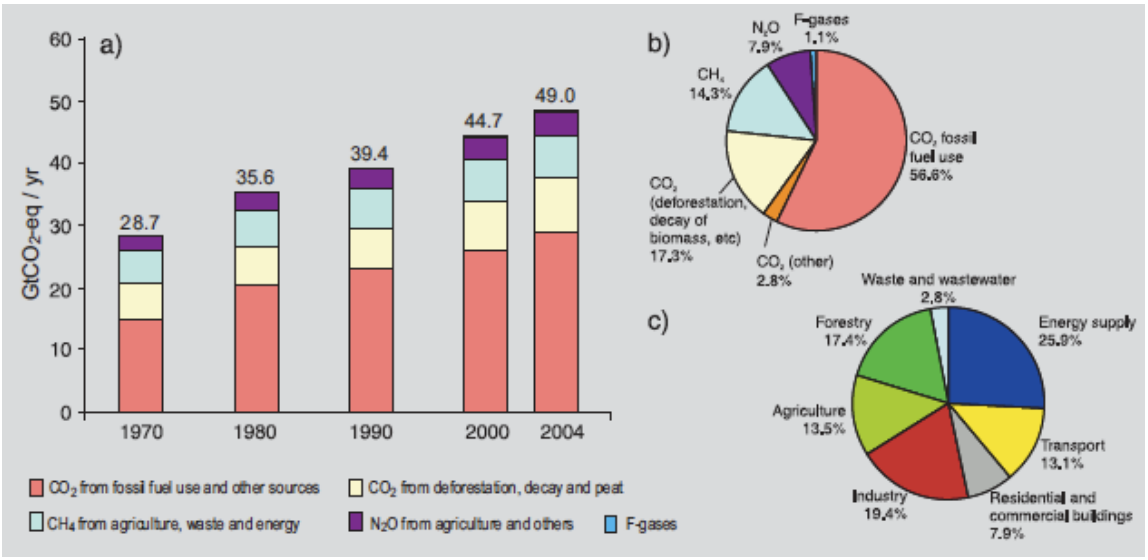


Figure 4: Global Anthropogenic GHG Emissions (Bernstein Lenny, et. al. 2007)

Of the total global greenhouse gas emissions in 2004, carbon dioxide emitted from the burning of fossil fuel usage accounted for 56.6% of all man-made GHG emissions (Figure 5(b). This proportion is even higher in the UK. For example, the Department for Energy and Climate Change estimates that "85 percent of the UK's man-made GHG emissions in 2007 were due to carbon dioxide" (Department for Energy and Climate Change 2007).

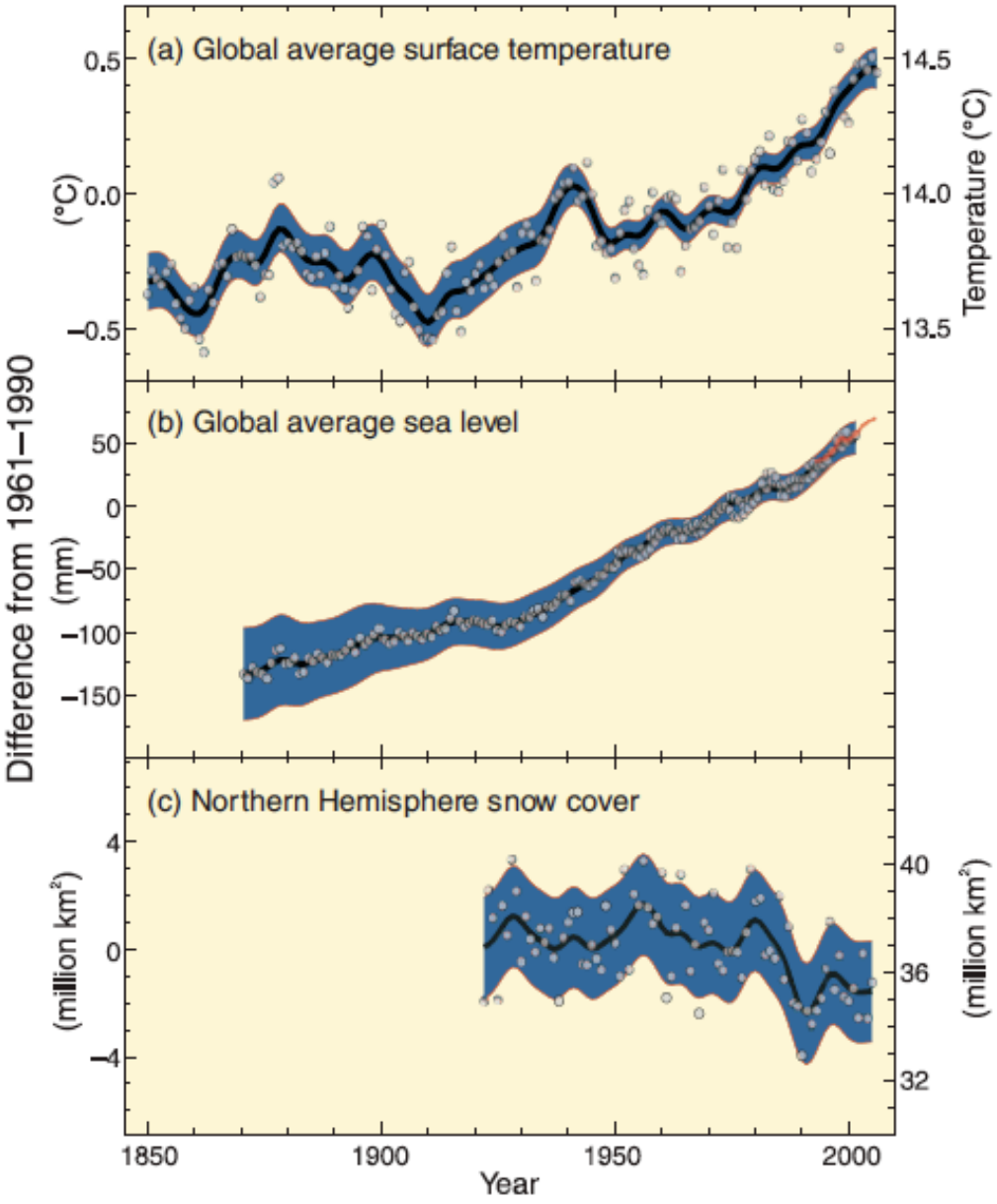


Figure 5: Changes in Temperature, Sea Level, and Northern Hemisphere Snow Cover (Bernstein, Lenny, et. al. 2007)

The IPCC concludes that "warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level

[as shown in Figure 5]" (Bernstein, et. al. 2007). Other noticeable weather patterns witnessed over the last 50 years include:

- The frequency of cold days and nights has decreased, whereas the occurrence of hot days and nights has increased
- Increased heat waves throughout land locked areas
- Heavier rainfalls are more prevalent over most of the Earth
- Average sea levels have been steadily rising (Bernstein, et. al. 2007)

The IPCC AR4 predicts that an abundance of extraordinary weather patterns will transpire because the average surface temperatures will increase between 1.1 and 6.4 degrees Celsius by the year 2100 (Bernstein, et. al. 2007).

"It seems that the debate on the authenticity of global warming and the role played by human activity is largely nonexistent among those who understand the nuances and scientific basis of long-term climate processes. The challenge, rather, appears to be how to effectively communicate this fact to policy makers and to a public that continues to mistakenly perceive debate among scientists" (Doran, 2009).

2.2 Policies

While there is now a strong consensus within the scientific community regarding the causes and mechanisms of global warming, this consensus has emerged only in the last few years. There is still some disagreement over the precise nature and magnitude of adverse outcomes, and even greater disagreement about the most appropriate policy responses. As a result, a plethora of local, national, and international initiatives, policies, and agreements have been proposed over the past thirty years.

2.2.1 Worldwide Initiatives

The problem of global warming can only be addressed by a coherent international effort and there have been several major initiatives since 1988 (see Table 1). In 1992 the United Nations formed the Commission on Sustainable Development (CSD) to monitor and report on progress being made at international, regional, and local levels. The original purpose of the CSD was to ensure implementation of several initiatives, including Agenda 21, made earlier that year at the United Nations Conference on Environment and Development in Rio de Janeiro (United Nations, 2008). One-hundred seventy nine governments voted to adopt Agenda 21, which addressed several aspects of sustainable development including social and economical impacts as

well as means for implementation. The Agenda states, "Successful implementation is first and foremost the responsibility of Governments" (Agenda 21, 2009). The creators of Agenda 21 knew that this was a big first step for the world, claiming, "This process marks the beginning of a new global partnership for sustainable development" (Agenda 21, 2009).

Table 1: Worldwide Carbon Reduction Policies

Organization or Initiative	Year Implemented	Details
Intergovernmental Panel on Climate Change (IPCC)	1988	A scientific body that provides objective information on climate change. Plays major role consulting policy planning.
Agenda 21	1992	Calls for countries to work at cutting carbon emissions voluntarily.
Commission on Sustainable Development (CSD)	1992	Created to review progress being made in regard to Agenda 21.
Kyoto Protocol	1997	Commits countries to cutting carbon emissions by 5% of 1990 levels between 2008-2012
Johannesburg Plan of Implementation	2002	A plan to implement programs or initiatives set forth by the U.N. Encourages the use of partnerships.

The Intergovernmental Panel on Climate Change (IPCC), formed in 1988, is a scientific intergovernmental body that provides objective information on climate change. As a scientific body, it reports information based on scientific evidence, reflecting the viewpoint of the scientific community. The IPCC states that it presents information in a "policy-relevant but policy neutral way to decision makers" (Intergovernmental Panel on Climate Change, 2009). The information that is provided by the IPCC is well respected and played a key role in the Rio de Janeiro Summit, and played an even larger role in shaping the 1997 Kyoto Protocol. This protocol differs from the 1992 initiatives in that voluntary guidelines were replaced by legal commitments. The Kyoto Protocol set targets for the 37 industrialized countries to

reduce their greenhouse gas (GHG) emissions and 181 countries have now ratified the agreement. On average, these countries have committed to cutting GHG emission by 5% from their 1990 level between 2008 and 2012, although actual targets vary greatly from country to country. The Protocol requires that countries cut these emissions mostly through national measures; however, some cross-national mechanisms are allowed as means of meeting their targets. These mechanisms include emissions trading, clean development, and joint implementation. Under the Protocol, countries must keep precise accounts of their emissions by monitoring and then reporting their progress through annual inventories. There is also a compliance system that ensures countries are working towards their commitments and helps those that are having difficulties complying.

In 2002, the World Summit on Sustainable Development was held in Johannesburg, where 191 governments were represented. At this summit the Johannesburg Plan of Implementation was created. This plan covers a wide range of topics, but has a focus on renewable energy and sustainable development. It states that one way to make progress is to "enhance partnerships between governmental and non-governmental actors, including all major groups, as well as volunteer groups, on programs and activities for the achievement of sustainable development at all levels" (United Nations, 2009). The CSD is responsible for monitoring progress made towards this plan.

The United Kingdom is one of the countries that are leading the way into a greener future through a variety of initiatives in response to these treaty obligations. Not only have they signed on to all the major international treaties, the government has also set more stringent targets than those required. As such, the UK can serve as an example for other countries to follow.

2.2.2 United Kingdom Policies

The United Kingdom has implemented national proposals and standards to reduce the emission of greenhouse gases. The national government has adopted a policy stating that carbon emissions will be reduced by 60% from the 1990 level by 2050. The government has also set up numerous agencies to monitor and enforce its commitments to the Kyoto Protocol and its own policies (see Table 2). More than nine government

organizations are responsible for monitoring and enforcing implementation of the Kyoto Protocol.

Table 2: United Kingdom Carbon Reduction Policies

POLICY/Organization	Purpose
Climate Change Bill	60% local carbon reduction by 2050
Carbon Trust	Invested £17 million since 2005 in local implementation of low carbon technologies and gave grants to seven organizations in 2008.
Department for Communities and Local Government	Report annual housing statistics and provides funding and guidance for local organizations and partners.
Environment Agency for England and Wales; Scottish Environment Protection Agency	Responsible for the management, compilation, and reporting of pollutant emissions in the United Kingdom. This includes data collected from local authorities and partners.

According to the Town and Country Planning Association, TCPA, the national government plans to produce 10% of energy from renewable sources by 2010, 15% by 2015, and 20% by 2020 (TCPA ref). The national government recommends that local authorities enact plans that address environmental, economic, social and historical features. Table 2 lists prominent national policies and government organizations and how they affect the local level.

In order to meet national standards, local governments and communities are implementing Sustainable Community Strategies (SCS) and Local Area Agreements (LAA). Sustainable Community Strategies are joint efforts between the central government and local authorities to create better, sustainable communities. At the central government level, the Department for Communities and Local Government (DCLG) and other departments provide funding and close guidance for local communities on how to improve social, economic, and environmental aspects in the community.

A Local Area Agreement is a relatively new concept, first used in 2004/2005. "LAAs are three-year agreements, developed by local councils with their partners in a local

strategic partnership (LSP)" (IDEA.gov). These LAAs are short-term strategies to work towards the long-term goals of Sustainable Community Strategies. Each LAA has established up to thirty-five targets for the borough to reach. Before being implemented, the LAA must be evaluated by various government offices and then by the Secretary of State. LAAs began in a few small areas and were extended throughout the country, in phases. The Local Government and Public Involvement in Health Act 2007 required that all upper-tier local authorities create a new LAA between 2008 and 2011. These LAAs are overseen at the local level by Local Strategic Partnerships (LSPs).

The local authority is the lead partner in an LSP and is responsible for the LAAs. The LSP is "a non-statutory body that brings together the different parts of the public, private, voluntary and community sectors, working at a local level" (IDEA.gov.uk). As the council is the leading body of the LSP, the Communities and Local Government Act states that councils are expected to:

- Exercise a leadership and governing role by identifying and articulating the needs and aspirations of local communities and reconciling or arbitrating between competing interests.
- Have oversight and coordinate community consultation and engagement activities of individual partners and where appropriate combine them.
- Produce an SCS based on data and evidence from the local area and its population and establish a shared local vision and priorities for action.
- Produce a unitary and/or countywide LAA based on the priorities identified in the area's SCS. (IDEA.gov.uk)

Under the council, the LSPs are made up of a wide array of bodies. The Local Government and Public Involvement in Health Act 2007 listed groups that had a "duty to cooperate" in the partnership to work towards the achievement of the LAA. The bodies that fall under the duty are mostly public and include the police, the fire brigade, waste authorities, and many more. The goal of these LSPs is to develop and implement plans that provide the community with an improved quality of life and better services. These goals are reached through the long term SCS and the use of LAAs to provide faster results. In addition to national policy, the Greater London Authority has set standards to be met by local boroughs and authorities.

National Indicators (NI) are used to measure or track local government performance in meeting LAA targets. These indicators have been developed in response to the white paper, "Strong and prosperous communities", as part of an overall framework to monitor the performance of local government. "The backbone of the new framework is the 198 indicators against which local government will begin to report its performance from April 2008" (Defra, 2008). One of 13 of the indicators proposed by the Department for Environment, food, and Rural Affairs (Defra) is NI 186, "per capita CO2 emissions in the LA area." NI 186 is driving the creation of many climate change strategies, energy strategies, and partnerships at the local level.

In March 2009, the United Kingdom published a carbon emission draft known as the Carbon Reduction Commitment (CRC). The CRC is a monetary incentive to lowering emissions in the UK. Public and private organizations that consume an average of 6000MWh or more over a period of one half hour in the year 2008 are obliged by law to comply with the CRC. Failure to join the CRC will result in penalties of no less than £5000(Defra, 2009).

Participants will be required to monitor emissions and purchase allotted time allowances from the government if they wish to emit more than the mandated emission limits, as shown in Figure 6, below.

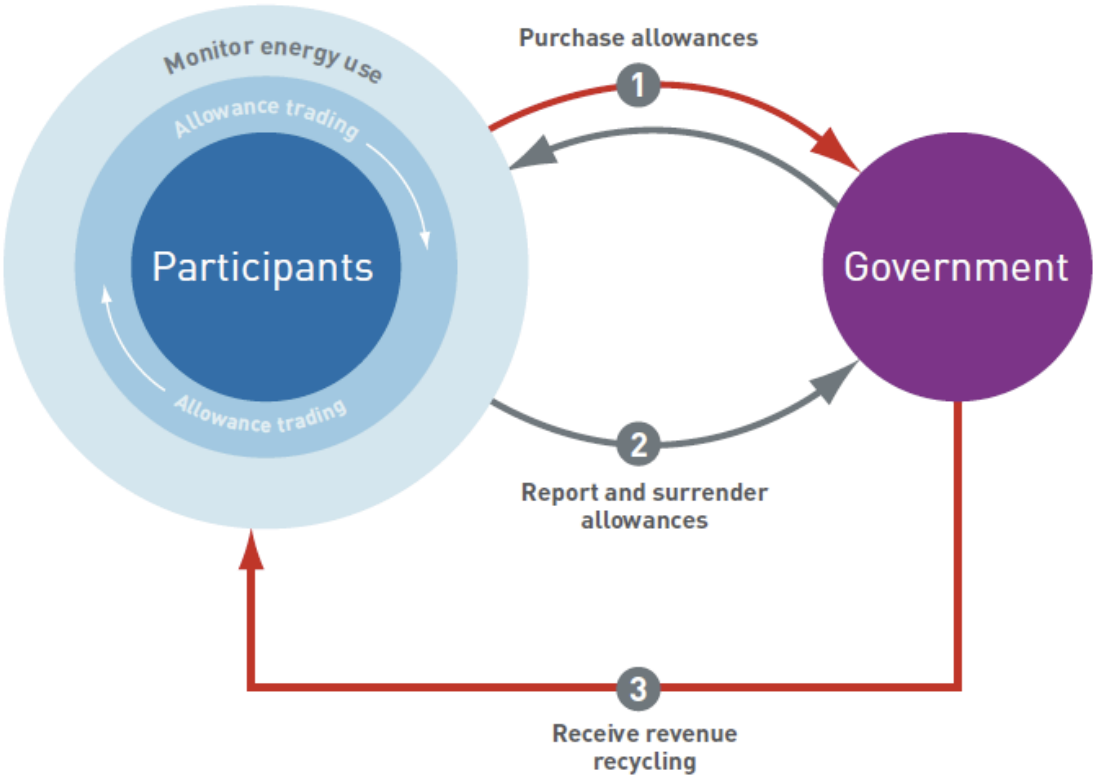


Figure 6: Monetary Cycle within the CRC (Defra, 2009)

After an undetermined amount of time, the participants will have to relinquish energy data to the CRC and surrender the purchased allowances as seen in number 2. The funds received by the government will be awarded to those participants that lower their emissions, which will be in excess of both their initial energy bill as well as the purchased allowances. Those participants that do not meet the carbon emission goals will be required to pay a monetary fine that will be determined once the CRC is in effect. The United Kingdom will therefore give large companies the opportunity to save money on energy, provided that they meet or exceed the carbon emission goals set forth (Defra, 2009).

One initiative that has been working to help local authorities meet these goals is the Nottingham Declaration on Climate Change which was signed by the Royal Borough of Kingston in August 2007. This Declaration has been signed by over 340 local authorities and is mostly focused on encouraging progress towards meeting the goals set forth in the UK Climate change Bill, the Kyoto Protocol, and towards the carbon reduction targets in 2010. The Declaration "recognizes the role of local authorities in leading society's response to the challenge of climate change." It also commits the Council to seven goals which include participating in local and regional networks for

support, encouraging all sectors in the local community take steps towards reducing their own greenhouse gas emissions, to monitor the progress of their plans and to publish the results, and to create an energy strategy within two years of signing. The Nottingham Declaration webpage also offers advice on how to achieve these goals and deliver on the National Indicators.

2.2.3 Local Policies

Most of the local authorities have initiated a variety of programs and policies to reduce carbon emissions. A great catalyst for these initiatives was the Local Government Act 2000. The Act introduced a program that would "strengthen the links between councils and local people" (Royal Borough of Kensington and Chelsea, 2008). The main requirement of the act was that the local authorities should be covered by a Local Strategic Partnership (LSP), which would bring together the public, private, business, voluntary and community sectors to identify the top priorities of the community and to work with local people to address them.

The Kingston Strategic Partnership is made up of various organizations, ranging from the Kingston Police to Job Centre Plus, a government agency that supports the work force. The main initiative that the partnership put together is "The Kingston Community Plan" with the purpose of contributing to the "sustainable development in the UK" (Kingston Community Plan, 2009). The Plan aims "to set strategic long-term vision for the economic, social, educational, cultural and environmental well-being of a local area in a way that contributes to sustainable development in the UK."

The newest edition of the Community Plan sets forth three main themes to accomplish the goals stated above. With regard to the environment, which is the first and most important theme, the objectives are to "tackle climate change", reduce the Ecological Footprint, ensure a sustainable borough, promote sustainable transport, and "protect and improve the quality of the local environment" (Kingston Community Plan, 2009). The main goal is to prepare "Kingston for the impacts of Climate Change" and to reduce the CO2 emissions to contribute to the UK national targets of reducing the CO2 emissions by 26-32% by 2020 and 60% by 2050. A set of actions that the plan proposes can be seen in Table 3 below:

What we will do	What success will look like
● A co-ordinated approach to tackling climate change mitigation and adaptation.	● A borough wide climate change and energy partnership; ● A sub-regional (South London) approach to meet the climate change challenge; ● A prioritised Action Plan for the borough to prepare for the 50 year climate impacts on infrastructure, the economy, and health.
● To meet the energy hierarchy of: – reduce energy use – use energy efficiently – use renewable/clean energy	● More energy efficient buildings (both new and retrofitted); ● 10% renewable energy on new build.
● Creating low carbon communities.	● A low carbon zone in the borough – where a range of co-ordinated activities take place to reduce carbon emissions, increase energy efficiency and alleviate fuel poverty.
● Influence people's behaviour to reduce our Ecological Footprint.	● A clear understanding of what it means to reduce our Ecological Footprint; ● Action Plan and Monitoring system in place and adopted by partners; ● Information made available to enable public to make informed choices to influence their behaviour.
● Kingston Council to ensure sustainable capital investment and procurement policies.	● Track record of sustainability at all levels.
● Lead four borough waste partnership and implement new waste collection scheme	● Lower levels of residual waste and landfill; ● Higher levels of recycling and composting.
● Support voluntary and community sector/third sector organisations working with the community on green issues	● Lower levels of waste; ● Higher levels of recycling

Table 3: List of actions to support the long term goals (Kingston plan – Kingston's vision for 2020, 2009)

A new LAA has been developed for Kingston that sets targets for per capita reduction in CO2 emissions of 10% for the years 2008-2010. It calls for this to be done by achieving reductions of 2.5% in both 2008 and 2009 and a 5% drop in 2010. These targets will be assessed against the baseline of 5.9 tons per capita which comes from 2005 data provided by DEFRA. Also, included are DEFRA estimates for potential reductions in CO2 for the years 2010 and 2020 which are provided to all local authorities. These potential reductions for Kingston are 14.6% for 2010 and 26.6% for all measures in 2020. The LAA supports the Sustainable Communities Strategy being

developed by the LSP. The Nottingham Declaration on Climate Change is a driving force behind this as well, as it requires work in partnership to produce a Climate Change Strategy which addresses both mitigation and adaptation. As a means to see these targets are met, the LAA provides a list of actions that would reduce carbon emissions. It states that the LSP needs to develop a Climate Change Partnership that is responsible for producing a Climate Change Strategy in the borough. The LAA also requires the Energy Strategy for the borough be completed by the Council. As a means of implementing some of these initiatives, the LAA calls for a local program and materials be developed to ensure that action is being taken by the local community at an individual and organizational level. The energy strategy should also include information about, and direction to, resources and support to effect change. Information on all the measures accounted to achieve the potential CO2 reductions indicated by DEFRA should also be included.

The Royal Borough of Kingston developed an initial draft of the Kingston Energy Strategy, which is the first part of the Climate Change Strategy and complies to the goals set forth by the LAA. It addresses the issues of tackling climate change as well as how the borough needs to adapt to the inevitable effects. It will work in parallel with existing strategies to identify "energy matters to ensure they are addressed through all the Council's responsibilities." (Energy Strategy, 2009)

In order to set an example for the community, a set of objectives was adopted to consider the three roles of the Council: Community Leader, Planning Authority, and Service Provider. The emphasis is placed on the fact that the council is the community leader and that it will play a major role in creating energy awareness. The table below shows a list of the principal objectives created by the council.

Principal Objectives for the Council as a Community Leader

1. The reduction of CO_2 emissions arising from energy consumption by all sectors (Domestic, Industry and Commerce, and Transport).
2. Greater energy and water resources efficiency.
3. A greater proportion of purchased and generated energy from renewable and clean alternative energy sources.
4. A local research and development network with educational institutions, businesses and industry to develop local evidence and best practice.
5. A local labour and skills capacity to raise awareness and deliver energy improvements.
6. Opportunities to make best use of support and finance for investment in energy awareness and energy improvement programmes.
7. More members of the community committed to personal responsibility for their energy use and carbon emissions.
8. Action to alleviate fuel poverty.

Table 4: Principle Objectives of the Energy Strategy (Energy Strategy, 2009)

Each objective is analyzed in terms of the already implemented initiatives and the future actions that can be done. The main objectives are to reduce the carbon emissions in all sectors and to improve the efficiency of current energy sources. On top of that, renewable energy sources are important aspects that are discussed in the strategy. The Royal Borough of Kingston, however, is not the only borough working towards lowering emissions.

The London Borough of Merton has been on the leading edge of climate change policy at the local level and has developed what has become known as the Merton Rule. This states that the construction of large non-residential buildings must obtain 10% of the necessary energy from renewable energy sources. A new addition to the policy is to reduce the carbon dioxide emissions of existing residential buildings by 10% (The Merton Rule, 2006). Many local authorities in the UK have adopted variants of the Merton Rule. A survey from the Town and Country Planning Association (TCPA) regarding the adoption of policies similar to the "Merton Rule," shows that almost 50% of the authorities surveyed had either adopted the Rule already or are developing comparable renewable energy policies (TCPA Merton Rule Report, pp.2, 2006). Table 5 shows some of the authorities with challenging targets on renewable energy usage:

Authority	Policy status	Target (energy generation)	Threshold
Barking & Dagenham	Draft	20% of predicted energy demand or greater	All developments over 2,000sqm
Carrick	Draft	15% of predicted energy demand or greater	None
North Devon	Adopted	15% of predicted energy demand or greater	50 or more residential or 1,000sqm for all other developments
North Somerset	Draft	15% of predicted energy demand or greater	All residential or 1,000sqm for all other developments
Reading	Draft	15% of predicted energy demand or greater	10 or more residential or 1,000sqm for all other developments
Three Rivers	Developing	20% of predicted energy demand or greater	10 or more residential or 1,000sqm for all other developments
Woking	Draft	20% of predicted energy demand or greater	Unspecified

Table 5: Local Carbon Reduction Policies (TCPA Merton Rule Report 2006)

A main goal of Merton's Climate Change Strategy is "to cut CO_2 emissions by 15% by 2015 in the borough" (London Borough of Merton: Climate Change Strategy, 2008).

Another borough taking action against carbon emissions is the London Borough of Islington, which has set up the Islington Climate Change Partnership. The system that Islington has developed is very similar to the one that Kingston is in the early stages of implementing. The Climate Change Partnership is funded by the Islington Strategic Partnership, and consists of public, private and voluntary sector organizations. The Climate Change Partnership integrates local action to reduce carbon emissions, and links national and local targets with direct action (Carbon Baseline Study 2008). The partnership communicates and reports via a private website, requiring a username and password. A carbon baseline study for Islington was conducted by the Centre for Sustainable Energy, and is used to calculate the emissions produced by the members and the efficiency of their buildings, with an emphasis on where emissions can be reduced most effectively (Carbon Baseline Study 2008). This study provided a means for the partnership to determine overall emissions, and share information in order to meet the ambitious carbon reduction goal by over 100 organizations of 15% by 2010. Another ambitious goal was set to expand the partnership by that 2010 to represent 125,000 tons of carbon-dioxide emissions (Carbon Baseline Study 2008). All members who join the Climate Change Partnership sign a document that pledges them to the

partnership's goals and to help the other members meet those goals. Kingston has commissioned the Carbon Trust to conduct a similar baseline study for the borough.

One way that local authorities and organizations throughout the United Kingdom are determining their CO_2 emissions and how to reduce them is through the use of the Carbon Trust. The Carbon Trust is a private company that was set up by the government in 2001. It is their mission "to accelerate the move to a low carbon economy by working with organizations to reduce carbon emissions and develop commercial low carbon technologies" (Carbon Trust 2009). The Carbon Trust offers services in five main areas that are devoted to creating a low carbon economy. One of the services provided by the Carbon Trust is a comprehensive audit called the "Local authorities Carbon Management Programme." This program is a five step process that mobilizes the organization which includes (Carbon Trust 2009):

- Build a team and determine the scope of the project.
- Set baseline, forecasts and targets, and identify the goals.
- Identify and quantify the options, or the risks and opportunities presented by climate change.
- Finalize a strategy and implementation plan which should be a cost effective way to cut emissions and save money.
- Implement the plan, including budgets, targets and success indicators.

These recommendations can include simple steps ranging from changing light bulbs or light switches to creating their own renewable energy strategy.

Similar to the Carbon Trust, the Energy Savings Trust (EST) is a resource that is being used by local authorities. The EST provides services to the corporate, business, and public sectors. One of the main goals of the Trust is to provide advice on the creation of sustainable energy strategies for local authorities. The EST evaluates carbon emissions throughout the entire borough from all different sectors and compiles the data to provide suggestions on targets that can be achieved and recommendations about how they may be achieved. The Royal Borough of Kingston recently consulted with the EST in order to gain insight on the formation of their Energy Strategy. The results of this consultation were released in March 2009 and include information on how the borough is currently performing in certain areas with regards to climate change, as shown below.

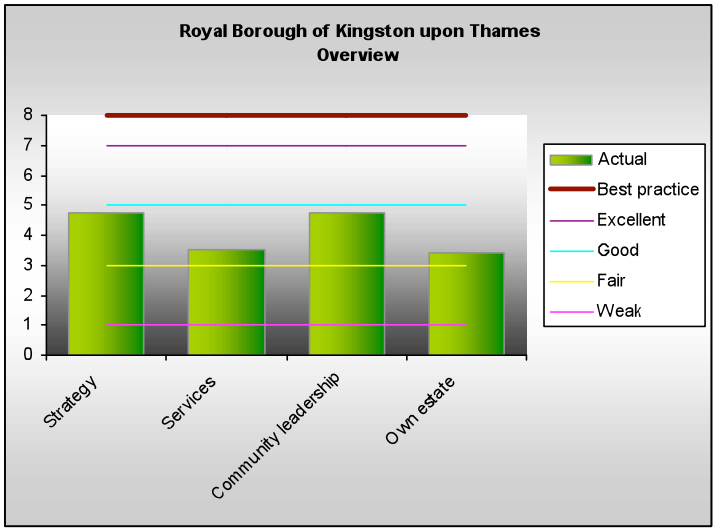
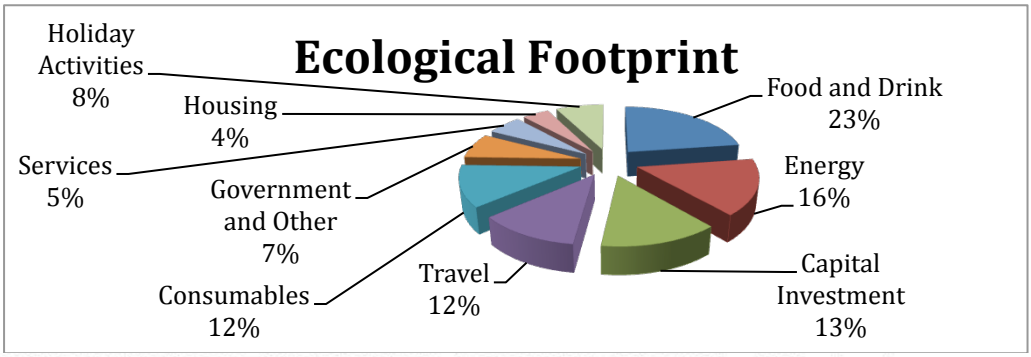


Figure 7: EST Evaluation of RBK actions toward Climate change (Local area carbon emissions reduction report, 2009)

In addition, the report provides recommendations to combat the effects of climate change in various sectors of the Borough. The council is able to implement these recommendations into the energy strategy.

One emission lowering initiative already in place in the Royal Borough of Kingston involves recognizing and working to counteract current carbon emissions trends in the world and in the community. The world ecological footprint is 2.2 global hectares per person (how much land a person uses in order to support all of his needs) while for the Royal Borough of Kingston the number is 5.64, a much higher value (Birth et. al, 2006). The following chart (Figure 8) shows a breakdown of Kingston's ecological footprint. Birth et al. (2006) identify the major activities contributing to carbon emissions and consider ways to reduce emissions from these activities (Birth et al., 2006, p.6). Figure 8 shows that two major contributors of carbon emissions are food industry and household energy consumption.



KINGSTON UPON THAMES' ECOLOGICAL FOOTPRINT = 5.64 gha. / per person

Activity Category	Main Consumptive Items included in Category	Ecological Footprint (gha/capita)
Food and Drink	Food and drink purchased for home consumption, alcoholic drinks purchased in a public house, restaurants and other eating out establishments as well as take-aways.	1.28
Energy	Domestic fuel including gas, electricity and other fuels such as oil or bio-fuels	0.89
Capital Investment	Investment in tangible fixed assets such as plant and machinery, transport equipment, dwellings and other buildings and structures	0.76
Travel	Car fuel, the impact associated with purchasing and maintaining private vehicles and public transport (bus, train, coach, air travel etc.)	0.66
Consumables	Includes durables and non-durables items including newspapers, clothing, appliances, glassware, tools, medical products, audio-visual equipment, personal effects etc.	0.66
Government and Other	Includes the resources used by national and local government, universities and colleges and balances the Ecological Footprint by taking out overseas tourists in the UK and changes in stocks	0.40
Services	Includes private hospital and education, postal, telephone, water supply, recreation, insurance, financial services etc.	0.31
Housing	Building, maintenance and repair of dwellings	0.24
Holiday Activities	Any consumption by UK residents overseas, from hotel energy requirements to eating out and shopping	0.43

Figure 8: The Royal Borough of Kingston Ecological Footprint (Rachel Birth et. al, 2006)

Based on this study, the borough created a leaflet that allows the citizens to check their lifestyle impact on the ecological footprint. The leaflet contains mostly qualitative information about common activities, offering an easy way to calculate each person's impact, as well as tips on reducing it (What Size are Your Feet? 2005).

Several environmental groups in the borough of Kingston participate in the Community Environmental Action and Sustainable Development section of Kingston's Council (Royal Borough of Kingston, 2009). Organizations like Kingston Friends of the Earth and Kingston Green Fair show that the borough is making efforts to increase community awareness for a "greener" way of life. The many efforts already in place

around Kingston have important goals, and are being followed by constant changes in the council's organization towards higher emphasis on environmental issues.

2.3 Web Development

There has been a dramatic increase in local government Internet usage from the years 1995 to 2000. "The implementation of web technology by local governments has significantly increased to 83.7 percent in 2000 and 70 percent of local governments without web sites planned to set up web sites within the next year." (Kim, 2007) Unfortunately, problems arise because local governments model their website on commercial websites that attempt to sell product, rather than utilizing government website model that provides "interactions between government agencies and the public." (Kim, 2007)

Main category	Sub category
Performance	Download delay
	Broken links
User activity support	Multimedia
	Involvement
	Navigation
	Open system
	Respond
	Register
	Built-in emailing function
	Different point of view
Content	Hierarchical structure
	Suggested keywords
	Internal search engine
	Versatile
	Incorporate traditional media with online
Look & Feel	Maintain consistency
Security	Spam mail

Figure 9: Key Guidelines for Government Websites (Kim, Hyung N. 2007)

Guidelines must be adopted to ensure that the government website is effective in providing a seamless, interactive experience for the community. Figure 9 shows one example of key guidelines for designing a local government website based on a survey of 'typical' users (Kim, 2007). The website recommendations set forth by Kim relate specifically to public awareness websites, but many of the same principles are directly

relevant to private websites as well. According to this survey, the average website user wants a clean, hierarchical structure, an interactive, multimedia rich environment, and a consistent, easy to use user interface. A private website still relies on user input and therefore can be modeled from the findings in figure nine.

To encourage the development of high quality and user-friendly government websites, the Cabinet Office has published a set of "Guidelines for UK government websites" (Mangham, 2003)., The report's most important criterion is to provide adequate resources to maintain the website. A "content management system" must be implemented to allow a plethora of government officials to upload information, not just those knowledgeable about web development. (Mangham, 2003) Another important guideline, recommended by the Cabinet Office, is that the website "be both accessible and usable." (Mangham, 2003) The Disability and Discrimination Act requires that all UK government websites make efforts to accommodate the disabled. For example, the website should provide an option for larger font or louder volume for those who are vision or hearing impaired. (Disability Discrimination Act 2005) Also under the usability guideline, the Cabinet office recommends the addition of multimedia features, such as videos, photos, or audio, to enhance the interaction between user and website. (Mangham, 2003)

The Public Accounts Committee from the United Kingdom's House of Parliament released a report, "Progress in improving the management and quality of government websites." (Committee on Public Accounts, 2008) According to this report, "The Government's own service transformation strategy requires services to be designed around the needs of the customer or citizen, rather than the service provider" (Committee on Public Accounts, 2008). Therefore, an assessment of customers' needs is necessary to the development of a useful website.

3 Approach, Analysis and Development

The goals of this project were to provide the Kingston Council with an effective website for the use by the Carbon Reduction Partnership and to offer recommendations on best practice of such partnerships. The website acts as a communication device for partners and includes a reporting area that can track the partnership's progress in reducing emissions. The team presented the Council with a series of recommendations for best practices regarding the formation, structure, and operation of the partnership. In order to achieve these goals, the team met the following objectives:

1. Characterize the proposed structure and purpose of the Partnership while also determining its key members.
2. Evaluate the partner's expectations from the website, their intended use, and find which features they would like to be included.
3. Examine similar Local Strategic Partnerships to determine best practice in regards to initial structure and overall workings of these partnerships, as well as to identify communication or reporting tools that were incorporated into the Kingston Partnership's website.
4. Clarify the technical specifications and available software tools for the website with the Kingston ICT staff, and then use this information to meet the needs of the web tool, determined from interviews with the partners.
5. Develop a set of recommendations on the characteristics and best practice of an effective partnership and include further recommendations on maintenance and upkeep of the website.

This chapter discusses how the team gathered, analyzed and implemented information from different areas towards the completion of the website and the set of recommendations. The first task was to review documents that were unavailable in the preparatory stages and add the information to the background section. In-depth, semi-structured interviews were conducted with RBK Climate Change and Sustainable Travel (CCST) officers, representatives of organizations identified as potential members of the Carbon Reduction Partnership, and representatives from similar partnerships in other Boroughs. The CCST officers were interviewed to elicit detailed reasons for the creation

of the partnership, the proposed structure, and how the website could be utilized by the partners. Interviews held with potential partners supplied the team with useful feedback on the initial prototype as well as many other helpful suggestions that led to further development of the website. Representatives from similar partnerships were valuable as they allowed the team to examine positives and negatives of their operations, as well as effective communication and reporting tools that are being used in more developed partnerships.

The team evaluated the main points from the three sets of interviews and created a comparison chart, key findings table, and matrix. With the main points grouped together, a comprehensive matrix was created that showed the relation of all the findings to the completion of the web tool (Appendix B). The website was then tailored to include as many of the desired features as were compatible with the software.

3.1 Interviews

Interviews played a vital role in gathering the information needed to meet the project objectives and create an effective and appropriate website. Members of three major groups were interviewed, five RBK Climate Change and Sustainable Travel Officers (CCST), two organizations identified as potential partners, and four representatives from similar partnerships in other boroughs. The informants were first identified through referrals from CCST officers and further contacts were based on the information gathered in the interviews. Most of these interviews were semi-structured and tended to be of an informal nature. Typically, two members of the team conducted the interviews in-person with each informant, although several interviews were conducted by phone. The conversations were not recorded but one member of the team took detailed notes while the other directed the questions. The notes taken from these interviews were later analyzed and compared to identify common themes in order to best meet the needs of the partnership. Minutes from each interview can be found in Appendix A.

3.1.1 Climate Change and Sustainable Travel Officers

The Climate Change and Sustainable Travel group was recently formed as a change to the Council's structure, combined the Environmental Services team and Road Safety and Travel Awareness team. This move emphasized Kingston's commitment to tackle

climate change. The interviews held with the CCST officers were conducted in order to elicit information on the following topics:

- The origins and future of the Carbon Reduction Partnership;
- The proposed organizational structure of the partnership, including the key individuals and organizations involved;
- The overall purpose of the partnership and how it will achieve its goals;
- What the partnership hopes to achieve through the use of a website;
- Important information or documentation to include on the website; and,
- Attributes or features, including security and tools, necessary to the site;

The first of these interviews was held with Shadia Rahman, co-author of Kingston's Energy Strategy (see discussion in section 2.2.3 above). During this conversation the team was able to gather pertinent information about the partnership's structure and key points that aided in the creation of the website. Shadia stated that the partnership will help the Borough meet the objectives set forth in the energy strategy. She explained that the website should be private to the partners and act as a means to exchange ideas and to discuss ongoing projects through the use of a forum. It was also determined that the tool should include an easy to use reporting database that can track progress being made by allowing managers at partner facilities to input energy usage in kWh. During the course of the conversation, it became clear that the Borough would also like to encourage local schools to also use the tools of the website to track energy consumption and carbon emissions as a requirement for National Indicator 185. This tool could act as a way to acquire the necessary information while also engaging students in energy awareness.

To elicit further information on the school development, the team interviewed Matthew Howard-Hughes, the CCST's liaison to Kingston's schools, to gain a better understanding of what this aspect may entail. Many schools are already aware of carbon reduction efforts and have extra-curricular groups that would be enthusiastic about such a tool. He stated that there would need to be eye-catching or graphical data to keep the users interested and also provide instructions or guidelines to ensure that children of all ages can use the tool. Matthew then said that he may be able to find a group of steering schools to test the prototype before the end of the school year.

Other informal conversations with Frances Smith, former Principle Environmental Officer, James Parker, the CCST manager, and Carlos Queremel, Community Environment oficer, provided the team with other valuable information. Frances Smith informed the team that stakeholders had indicated they would not like to meet more than once or twice a year. James Parker provided the team with information regarding the workings and recent changes that had been occurring within the council. He also gave the team an understanding of how the website and partnership will relate to his new CCST group. Carlos Queremel advised that it would be very beneficial to include an area that could show the partners energy saving products and where they can be purchased.

These interviews and conversations helped clarify the purpose of the partnership and how the website can help it be successful. It was discovered that the partnership will work to help meet the 10% reduction in CO_2 emissions by 2010 as set forth in their current Local Area Agreement, while also working towards meeting the requirements of National Indicator 186 and the objectives set forth in Kingston's Energy Strategy. The team was also made aware that this tool will eventually be utilized by a wider range of users than originally thought. At some point the website will need to be effective for everything from large and small businesses to schools and possibly the domestic sector while still providing the desired level of privacy. The fact that frequent meetings are not desired showed that a supplemental communication device beyond the website might be beneficial in order to keep partners engaged. It was seen that providing information, recommendation and links to energy saving data and materials would be useful to the future partners.

3.1.2 Potential Partners

In order to determine the desire from the partners for the ideas presented by the CCST officers, another set of interviews were conducted with two organizations that were identified as potential partners. As the partnership is only in its early stages, these organizations were identified by council members as some of the most likely to become a part of the partnership. To ensure that this tool will be useful to those who will actually need to use it, the following topics were covered:

- Background of the interviewee and organization;
- Their existing environmental awareness;

- What they would need from the website;
- How they currently communicate both within their organization and with the council; and,
- If there is a potential "environmental champion" within the organization.

Kingston First was one of the members of the Kingston Strategic Partnership identified as a primary group to speak with. The team met with Lucinda Raggett, the operations manager, who works with environmental issues for Kingston First. She informed us that their organization works to better improve business within Kingston Town Centre by catering to many of their needs, including keeping the streets clean, providing recycling, and providing seating outside of their store fronts. Lucinda stated that while many of the larger businesses would likely be willing to join, Small and Medium Enterprises (SMEs), or companies with less than 250 employees, are very difficult to recruit for such initiatives, as it is an inconvenience to them. She said that the benefits must be translated to money to produce a positive reaction. Ease of use will be critical to these small businesses and although they may not like it, meetings are likely the best way to share ideas and plans. The team found that Kingston First's help could be valuable. Their connections to hundreds of local businesses can be utilized to encourage the small to medium enterprises in the Royal Borough of Kingston to join the upcoming Carbon Reduction Partnership.

Kingston University is another potential partner. Several representatives from the university were interviewed on April 21, including Nicola Corrigan, the sustainability facilitator, Wayne Hitchings, the energy manager, and Elise Toogood. They informed the team that the University has been audited by the Carbon Trust and has already developed a carbon management plan, and tracks their emissions as a requirement for the Carbon Trust. The fact that they are already monitoring their emissions so thoroughly leads them to believe that a monitoring tool would not be useful to them. However, they would still like to be involved in the partnership as a way to keep involved with the community and they could be an important source of information to other partners. When asked if they would use the site to post recommendations or their carbon management plan as a case study, they seemed to find this a good idea that could be helpful to other partners. It was concluded that the communication tool will be a

valuable aspect of the web site, as it is a good way to discuss projects. This would be similar to the e-mail discussion in the networks they use.

These interviews made evident that the communication aspect of the website could be useful to smaller businesses. They would like to share ideas about new projects and how to implement them. A simple reporting tool was considered easier for the smaller businesses, therefore making them more likely to actually report their data. Posting case studies, useful links, and recommendations would be valuable to the partners. It will be difficult to recruit organizations to join the partnership, since some feel as if they do not need the tool, while others don't see the benefit or have the time to dedicate to the partnership.

3.1.3 Similar Local Strategic Partnerships

Interviews in other London boroughs where similar partnerships had already been formed provided both suggestions for the website and best practices within such partnerships. Topics that were covered to elicit these details included:

- The formation and structure of the partnership;
- Current communication methods employed by the partnership;
- Activities of the partnership;
- Reporting methods; and,
- Significant issues or problems and how they had been addressed.

The first of these interviews was held with Karen Lawrence, co-manager of the Islington Climate Change Partnership, a partnership that is currently working very effectively with over 100 active partners. Karen indicated that there is a steering group, made up of the largest partners, that meets once every one to two months to discuss new projects and the progress made. She indicated that she had personally made a website that is currently being tested with the steering group and that a forum has been working better than a blog. Karen emphasized that some people will simply never use the website so alternative means of communication are essential. She stated that in order to get the SMEs on board there must be something offered to them before asking them to make more than a minimum contribution of time, money, and other resources either to the activities of the partnership itself or to efforts such as reducing their own energy consumption. Events such as workshops specifically aimed at small businesses

have been successful and they also offer free audits to any business that joins the partnership as an immediate incentive.

Another interview was held with Ed Cotterill, Environmental Officer, from the borough of Merton. Apparently, the partnership was very strong, and active several years ago, at a time when the borough was on the leading edge, developing the Merton Rule, but the level of interest and enthusiasm among partners has waned more recently. One of the problems is that after the partners propose new ideas at their meetings, there is difficulty in communicating and getting these things off of the ground. Ed did state that one way to keep the partners interested and motivated is by providing free incentives, and even mentioned that audits were a very useful tool to partners.

Simon Evans of the Westminster Carbon Alliance was also interviewed for his experience in dealing with partnerships. He informed the team that he had been working on the London Energy Partnership for the Greater London Authority and only recently arrived in Westminster for the creation of the Carbon Alliance. Simon stated that they also utilize a steering group, but theirs is made up of a group of representatives, each one representing a sub-group in the partnership. This seems to be a more effective way to share information, as the partners within each group report to their representative who then reports to Simon. He also informed the team that he plans to meet with the steering group at least once every three months. The topic of offering free audits also arose, and Simon stated that these are a great way to pursue smaller businesses to join while also offering a great deal of help for them. Simon then advised that in order for a partnership to be successful, there needs to be a person working specifically on the day to day operations and functions of the partnership.

An informal phone interview was conducted with Peter McDonald from the Borough of Croydon, to gain information on their partnership's use of the "Carbon Hub" web tool. Peter informed the team that this tool allowed the partners to report their energy usage as well as many other aspects that effect their carbon emissions to provide a way to monitor the progress being made by the partnership. The Carbon Hub also acts as a networking tool for the organizations through the use of a discussion board. Peter stated that the partners feel comfortable releasing information on the Carbon Hub because the website is not controlled by the council and information is secured behind a login screen. One goal of the partnership is finding a "carbon champion" from each organization that will take the time to input all of the required data into the program

and also act as a person who motivates others to follow through on their energy commitments. Peter then revealed that the Carbon Hub costs about £10,000 per year to have an area specifically designed for their partnership.

These interviews provided much insight into the workings and behind the scenes actions of functioning partnerships. One of the recurring findings was that meetings play a vital role in organizing and bringing together the partners. It was also clear that the use of a steering group was quite helpful to the operation of these partnerships. Free incentives such as workshops or free audits are great ways to enlist smaller businesses while also providing them with helpful information. It is important for these partnerships to have a way of tracking their own progress, and the more frequently they can acquire these results, the more useful it is for them. A major finding was that in an effective partnership there is at least one person whose sole job is to manage the operations.

3.1.4 Additional Interviews

Supplemental interviews were held with other organizations that did not fall into any of the three categories, CCST officers, potential partners, or representatives from similar partnerships. These were two environmental businesses that were able to provide the team with additional information in regards to carbon emissions and their monitoring.

The first interview was held with Helen Clark-Bell of Go Green. Go Green provides free audits to SMEs in order to help them save money while reducing their carbon emissions. Helen stated that they work to put these small businesses on the "first rung of the energy ladder" by simply getting them to think about their everyday operations and where savings can be made. She also advised us that it is very difficult to get companies of this size (under 250 employees) to accept even free services because they are much more concerned about keeping themselves in business. Helen indicated that the benefits must be made clear in order for many of the SMEs to show interest. It was also uncovered that Go Green has worked with over 100 SMEs within Kingston and could be a great source to the partnership in terms of finding partners that have already taken steps towards reducing emissions.

A phone interview was held with Bruce Halai-Carter of First Impressions Last Longer, an environmentally friendly business that has achieved the status of being

carbon neutral. Bruce created the company based around an environmental policy and has produced his own carbon calculator. He advised that creating such a tool is incredibly painstaking and takes a great amount of time. He said many similar tools have already been developed and it is not therefore necessary or advisable to produce an entirely new tool. Bruce also told us that we had to be aware of how the conversions are constantly changing and needed to be updated and that it is also important to ensure consistency of the data collected from different partners. He also input his advice that for this type of partnership, there should be a manger that works toward making it successful.

With all of the information gathered from each of the interviews, the team acquired a great deal of information concerning many different aspects of the partnership and website. The task was then to compile and organize all of these thoughts in order to see how the advice from these experts could be utilized in the completion of the website and recommendations.

3.2 Findings and Analysis: Common Themes and Lessons Learned

The team created table 6 to highlight the key findings and lessons learned from the plethora of interview data. The CCST officers identified key findings one through four, which are the most important features to incorporate into the design of the website: password protected access, a forum, graphical data, and a list of recommended carbon reduction techniques. The CCST and representatives from similar partnerships provided key findings five through seven regarding the potential users of the website. Key finding eight and nine are direct evidence of effective forms of communication used by similar partnerships. Finally, the CCST, representatives from similar partnerships, and potential partners all mentioned that the goal of private organizations is to make money and monetary incentives must be developed on the website.

#	Finding	Source	Lessons Learned
1	Implement password-protected access	Karen Lawrence, Ed Cotterill, Shadia Rahman, Matthew Howard-Hughes, Helen Clark-Bell	A login page protects sensitive energy and emission data.
2	Forum, or discussion board, was the recommended web-based communication tool	Karen Lawrence, Shadia Rahman, Helen Clark-Bell	A forum provides the partners with a communication tool that is useful for project collaboration and generating answers to problems from a wide range of organizations.
3	Use graphical or visual data rather than excel spreadsheets	Matthew Howard-Hughes	Graphical data allows the partners a quicker, easier method of data comparison. A line graph is a simple, understandable way to display a rise or fall in carbon emissions over time.
4	List of recommended carbon reduction techniques	Carlos Queremel	The partners need to know about methods to reduce emissions that save money and require monetary incentives to use the tool.
5	Large organizations should set precedence for other partners.	James Parker, Shadia Rahman, Karen Lawrence	Most large organizations already monitor energy usage and carbon emissions. Other partners would benefit from their experiences about cost effective carbon reduction techniques.
6	Small and medium enterprises will benefit the most from the website.	James Parker, Helen Clark-Bell, Bruce Halai-Carter	The small and medium enterprises do not have the resources to track carbon emissions. The reporting form will provide an easy, quick tracking of emissions.
7	The website should be introduced into school curriculums or extra-curricular activities.	Shadia Rahman, Matthew Howard-Hughes	Students need to learn about global environmental changes and the website is a great tool to encourage a reduction in energy usage. Carbon emission data from schools is difficult for the CCST to monitor, and the tool provides an easy solution.

8	Regular meetings and workshops helped meet goals of similar partnerships.	Karen Lawrence, Ed Cotterill	Similar partnerships meet on a regular basis to discuss current events, carbon reduction targets, and carbon reduction methods. Interactive workshops provided the most instruction toward saving money and lowering emissions.
9	Emails and phone calls between partners and the CCST must augment regular meetings.	Karen Lawrence, Ed Cotterill, Helen Clark-Bell, Bruce Halai-Carter, Matthew Howard-Hughes	Meetings and workshops are useful, but direct, one-on-one communication, through email and phone calls, is the most effective communication between the partners. Similar partnerships saw results from regular emails in conjunction with the meetings and workshops.
10	The goal of private organizations is to make money.	James Parker, Shadia Rahman, Karen Lawrence, Ed Cotterill, Helen Clark-Bell, Bruce Halai-Carter, Lucinda Raggett	Saving the environment is not the first goal of most organizations. Providing money saving techniques is an effective method for encouraging partners to use the website and reduce carbon emissions.

Table 6: Key Findings

The lessons learned from key findings five through ten provided the necessary information to create a set of recommendations for the development of the partnership. Key findings one through four aided in the development of the website.

3.3 Website Development

In order to develop a website, the team deduced a set of goals based on interview data and background research. As discussed in the background section 2.3, a list of requirements for government websites had been established, which the team adhered to while building the tool. The governmental guidelines were combined with the information collected from the interviews to determine the following website necessities:

- Clean and professional user interface;
- Simple, but informative pages;
- User friendly reporting forms;
- Tools built based on data collected from potential users; and, be
- Easily updatable by RBK staff.

Emphasis was placed on ease of use for the partners. Go Green, and the CCST recommended the website be simple and easy to use, which would lead the partners to use each included feature. Many surveys of different user groups and the public in general have demonstrated the necessity for easy-to-use features on websites.

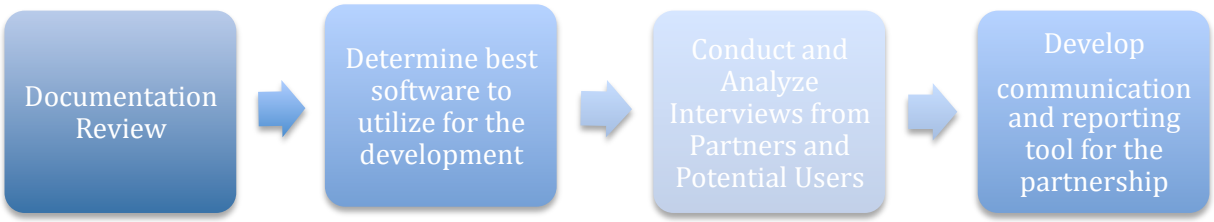


Figure 10: Web Development Process

The set of goals, as well as the construction of the website, was based on the web development process. Documentation or background review led to the goals noted above. Microsoft Sharepoint was the web development software identified based on information from ICT and Parabola Software. As described above several interviews were conducted to

identify key needs and concerns, which were factored in to the development of the final communication and reporting tool for the partnership.

3.3.1 Website Layout

The layout of the website, or a site map, in figure 11 represents the flow of the website as seen by the users. Before the user is allowed entrance to the website, a username and password must be entered at the login request. The welcome page follows, where the user decides which tool to access: the reporting form, list of emission reduction strategies, the document library, or the discussion board.

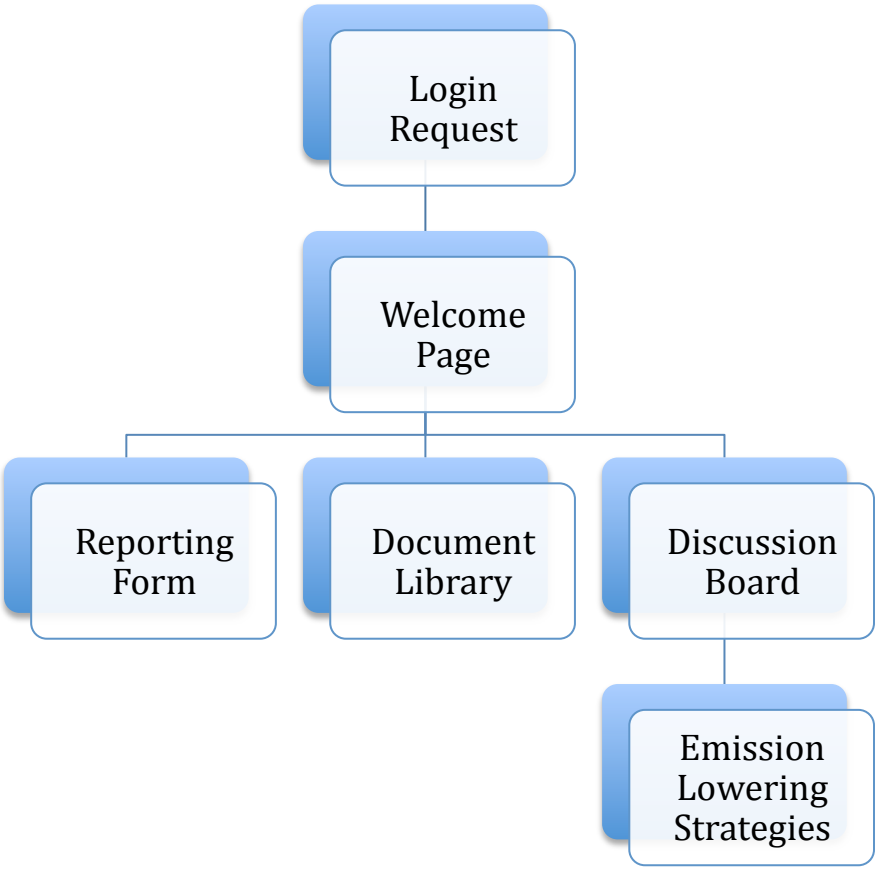


Figure 11: Site Map

3.3.2 Login Request

A login page is used to restrict the access only to the members. In order to access the rest of the website, the user must input a preregistered username and password which is then accepted by the login request. The implementation of the login request was determined from interviews with the CCST officers and similar partnerships. Energy

consumption information, as well as important documents, will be available and the public should not have access to them. Furthermore, Karen Lawrence and Ed Cotterill stated that ensuring privacy would encourage the partners to use the web tool.

Privacy was identified as crucial to the website. There are three levels of access. The CCST officers have access to all site content and have editing and updating rights meaning they are able to update the web-site at any time. The partners have access to all site content and can post information in all appropriate places. Schools have access only to the reporting and welcome pages. This ensures that students do not post inappropriate content and do not observe information the partners want kept private.

Permissions were made on the website for the team members, the head of the CCST department, James Parker, and Patrick Long, CCST officer, who will continue updating the website upon our departure. A set of temporary partner accounts was also created for the team, in order to test the functionality of the site from the CCST's perspective.

The login request is the first item that users will see upon connecting to the website. As seen in figure 12, the prompt contains username and password fields that ensure proper credentials from the members. The "remember me next time" check box places a cookie on the computer that automatically adds the password and username each subsequent time the user accesses the website. A user who does not type in the correct information is automatically brought back to the login request and cannot proceed further into the website.

Figure 12: Login Request

3.3.3 Welcome Page

Based on the capabilities of Microsoft Sharepoint and the interview data, a welcome page was created which can be seen below in Figure 13. Sharepoint is capable of adding "web parts," or easily organized boxes of information, to any webpage. The first page was built using different web parts to ensure a professional organization and ease of use for the partners.

The first section, titled "Welcome", explains why the tool exists, how the tool helps the user, and ends with a chart of the requirements set forth by the council. The next section, Guidelines, explains to the user how to navigate through the website and how to read the data at the bottom of the page. As stated, the bottom of the page includes topics from the discussion board, including the list of recommended emission lowering techniques, and the graphical data of the user's carbon emissions. From this web page, other areas of the website can be accessed via the left menu under the heading Carbon Reduction Partnership, providing an easy, intuitive way to navigate.

Welcome

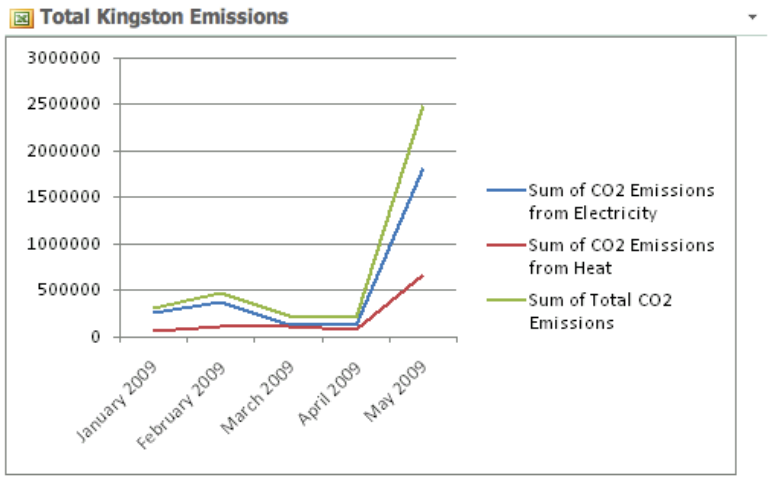
Welcome to the Carbon Reduction Partnership website. This tool will help you lower carbon emissions and help save the world. Global warming is a serious problem and together we will help reverse its effects. The Royal Borough of Kingston and the United Kingdom are beginning to require the reduction of carbon emissions and by using this tool you will ensure that money will be saved and guidelines are met.

Carbon Reduction Targets for the Royal Borough of Kingston			
Year	2008	2009	2010
Required Emission Reduction	2.5%	2.5%	5.0%

Guidelines

Below you can find **Graphical Data** regarding the overall progress of the Carbon Reduction Partnership. Data on each partner remains confidential and in no way can the graph be used to determine each partner's emissions.

- The **Partner List** link in the upper left displays links to each partners personal emission page. Partners can only view their own emission page.
- Energy usage should be added to the **Reporting Form** on the first of every month.
- Members can discuss topics regarding carbon emissions and find cost effective carbon reduction techniques on the **Discussion Board**.
- To review important documents regarding carbon emissions follow the link titled **Document Library**.



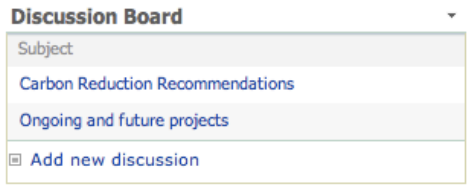


Figure 13: Welcome Page

3.3.4 Document Library

The CCST officers, specifically Shadia Rahman, recommended a document library. The documents could include news articles, published documents or laws from the council, audit information, project implementation information, etc. The partners have the ability to upload and review any document that may be useful for the partnership, and the CCST has the administrative power to remove unrelated documents from the library. Kingston University agreed with the CCST's idea to include a document library, which would allow them to access important documents regarding environmental issues.

The team built the document library with the use of Sharepoint's web parts. In fact, a documents or document library page was an existing option under the page creator of Sharepoint. The default document library page looks very similar to the figure below. The team added test documents to demonstrate the ease of use to both upload and review documents. The library acts as a typical folder a user may find on an existing computer, with drag and drop, delete, copy, and open functionality. Because Microsoft developed Sharepoint, a Microsoft Windows user will be comfortable understanding and using the document library.

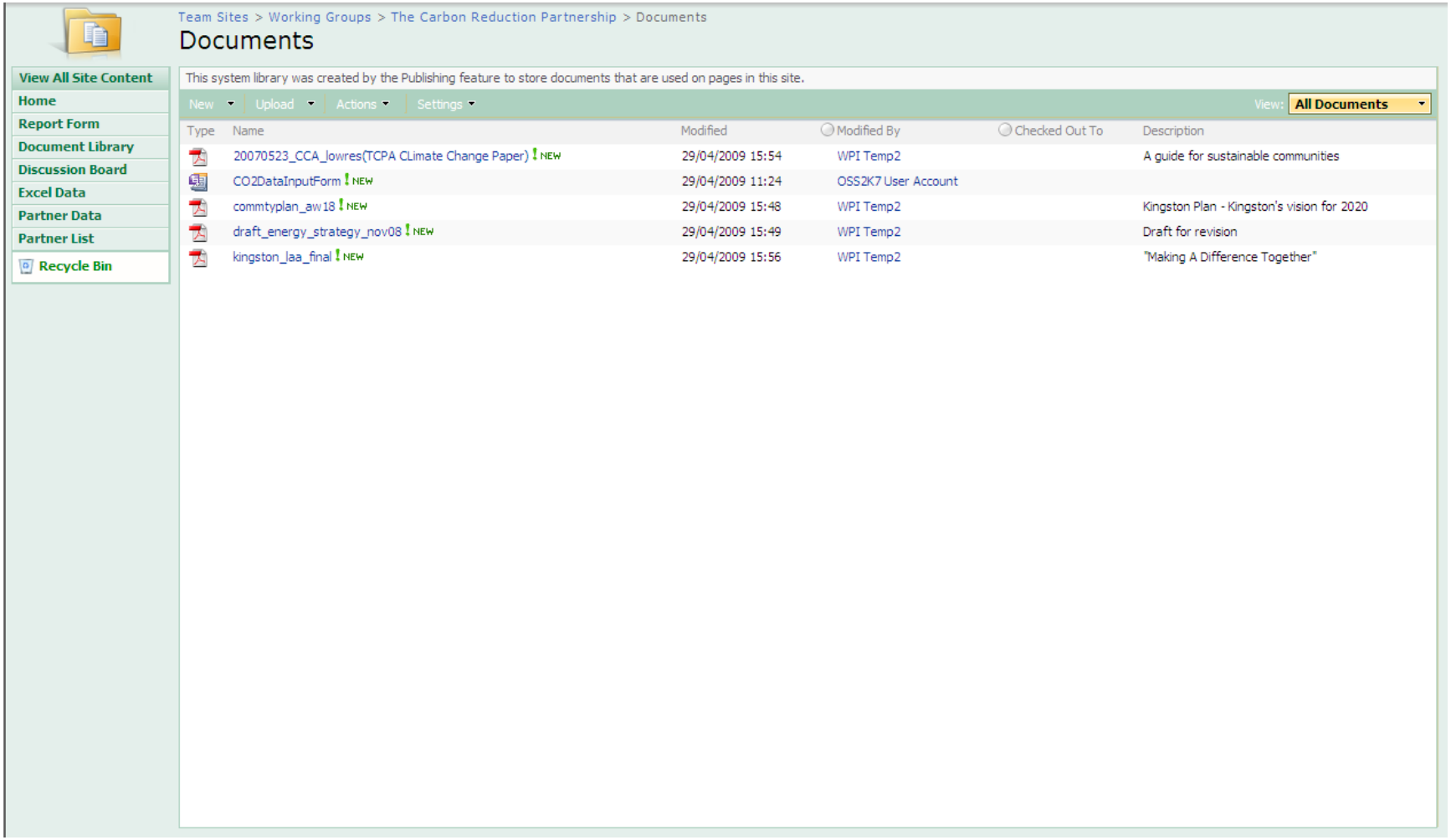


Figure 14: Document Library

3.3.5 Reporting Tool

The CCST officers stated the necessity of a carbon emission reporting tool in order to track data for the National Indicators 185 and 186. Shadia Rahman, Karen Lawrence, and Helen Clark Bell each criticized the eighteen-month to two-year return of carbon emission data from DEFRA. The web-based reporting tool needs to supply the CCST with data quickly, such as on a monthly or quarterly basis. Based on information from Helen Clark Bell and Shadia Rahman, the tool should allow the users to input energy usage based on electrical and heat meters and convert it into carbon dioxide emissions based on the DEFRA conversion factors (Appendix C). Matthew Howard-Hughes emphasized the need to display the input data as an easy to read graph over a period of time.

The reporting tool was first built on Microsoft Excel and then attached to the database using Microsoft Sharepoint. The Excel spreadsheet data is shown in Appendix D. A survey form is used to collect data on a monthly basis (Figure 15). The form asks for the date of submission. The form automatically associates each username with the organization that the user represents. The Excel spreadsheet uses partner A, B, C, and D as sample testing names. The survey form then asks for the electrical meter reading, the type of heat used within the building, and the heat meter reading. The meter readings are all required to be in kilowatt-hours, the typical meter-reading unit. Using conversion factors supplied by DEFRA, the input data is converted into kilograms of CO_2. Finally, the total emissions are summed together and displayed on two graphs, as shown in Figure 16 below. Each partner will be able to see how the overall borough is doing, as well as how that particular user is doing. Partner A will not be able to see Partner B and vice versa. The previous year's data is saved as a baseline and displayed as columns for each month, this way the partners can easily view and compare emission data to determine whether emissions are in fact being reduced over time.

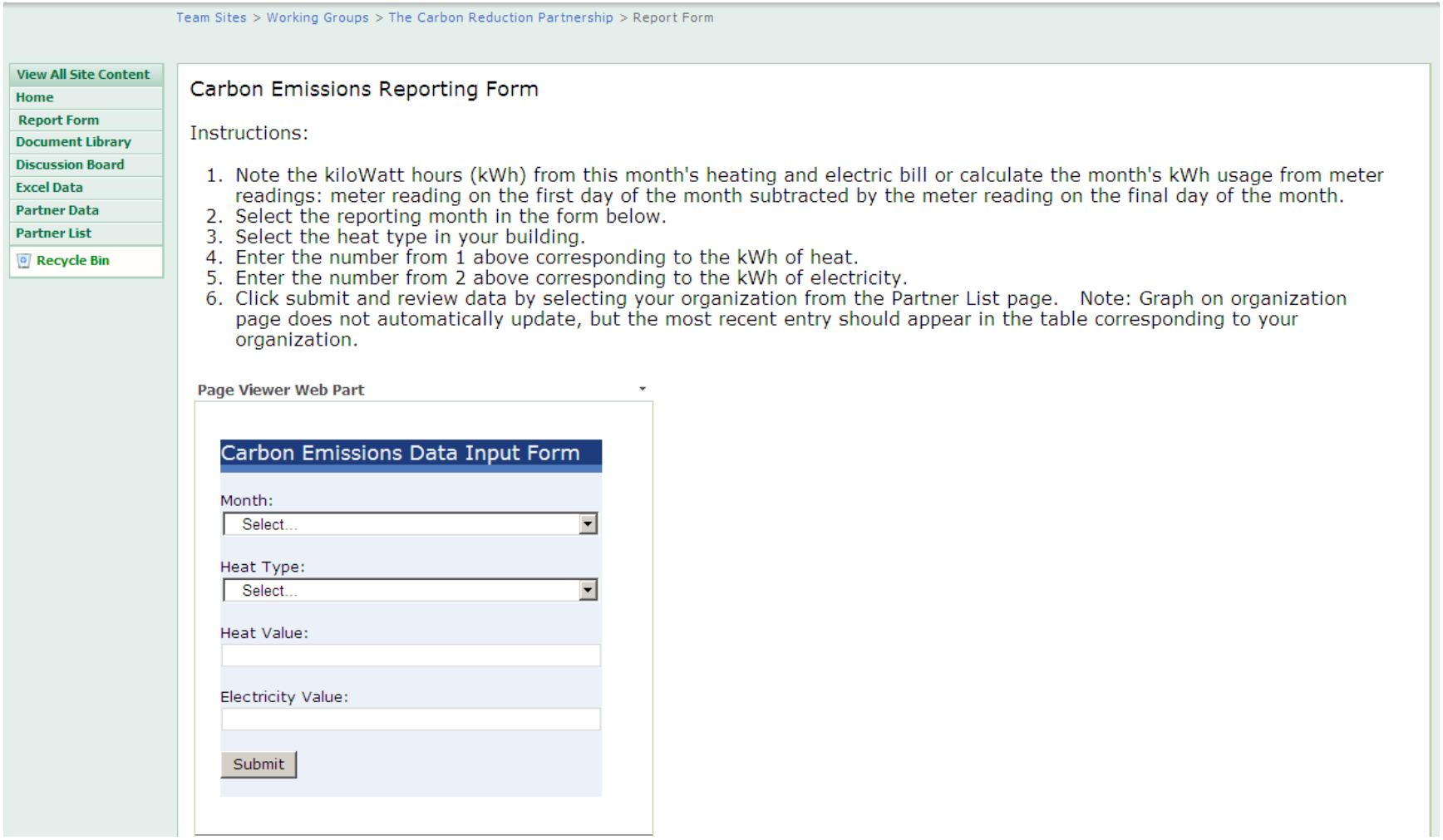


Figure 15: Reporting Form

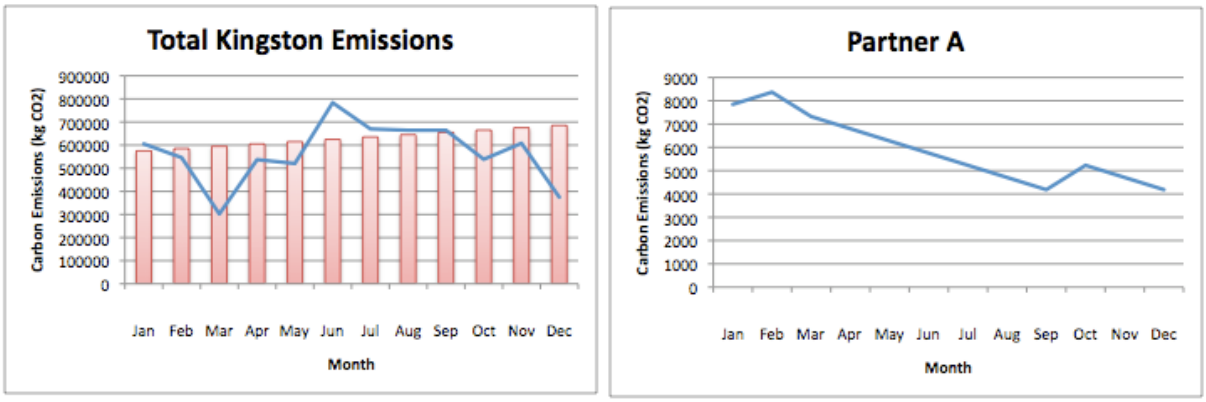
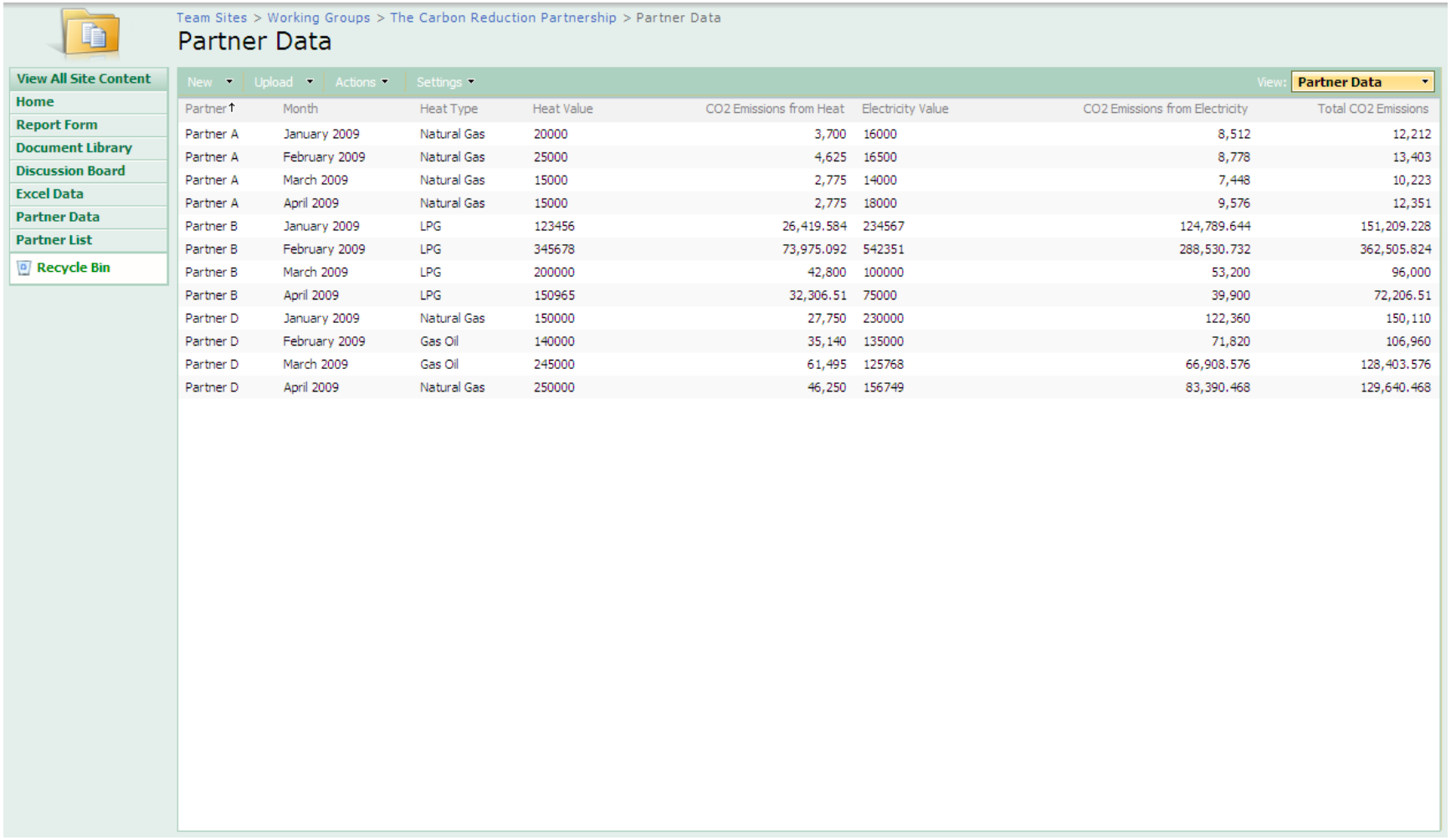


Figure 16: Overall Data Graphs

The CCST officers will have access to the database of numbers and therefore get a better understanding of proficiencies and deficiencies within the borough. A list with energy usage and corresponding conversion to kg of CO_2 based on the data obtain from the reporting form is available for the officers to review at all times. Figure 17 shows a list of fictitious data that was compiled to test and demonstrate the reporting form and graphical data.



Partner	Month	Heat Type	Heat Value	CO2 Emissions from Heat	Electricity Value	CO2 Emissions from Electricity	Total CO2 Emissions
Partner A	January 2009	Natural Gas	20000	3,700	16000	8,512	12,212
Partner A	February 2009	Natural Gas	25000	4,625	16500	8,778	13,403
Partner A	March 2009	Natural Gas	15000	2,775	14000	7,448	10,223
Partner A	April 2009	Natural Gas	15000	2,775	18000	9,576	12,351
Partner B	January 2009	LPG	123456	26,419.584	234567	124,789.644	151,209.228
Partner B	February 2009	LPG	345678	73,975.092	542351	288,530.732	362,505.824
Partner B	March 2009	LPG	200000	42,800	100000	53,200	96,000
Partner B	April 2009	LPG	150965	32,306.51	75000	39,900	72,206.51
Partner D	January 2009	Natural Gas	150000	27,750	230000	122,360	150,110
Partner D	February 2009	Gas Oil	140000	35,140	135000	71,820	106,960
Partner D	March 2009	Gas Oil	245000	61,495	125768	66,908.576	128,403.576
Partner D	April 2009	Natural Gas	250000	46,250	156749	83,390.468	129,640.468

Figure 17: Partner Data

3.3.6 Communication Tool

The communication tool is the major component of the website. Following the recommendations from many informants, the team created a forum (Figure 18). Unlike the other forms of web-based communication, the forum is based on a typical conversation: one user poses a question or topic, while other users post replies, which leads to a discussion based on the original topic. The forum supports the partners in their initiatives, providing them with a place to share ideas or to ask questions regarding carbon emission reduction strategies. The CCST officers have permissions to moderate the forum by deleting topics or replies and proposing new threads of discussion.

Similar to the document library, the forum is a default tool available in Microsoft Sharepoint. Therefore the tool is integrated with the rest of the website and is both professional and easy to use. The forum, as seen previously, is also displayed on the welcome page to attract further discussion between partners.

The interface contains a list of discussion topics that can be accessed. Each post or discussion topic has a reply button built into the upper right corner, which allows for a comment or answer to a question. Using the options bar above each post can also create new discussion topics. Each discussion topic is arranged in chronological order, but topics can also be found using the included search function. Figure 18 is an example post, which incorporates the reply button, the search bar in the top right corner, and the options toolbar above the post.

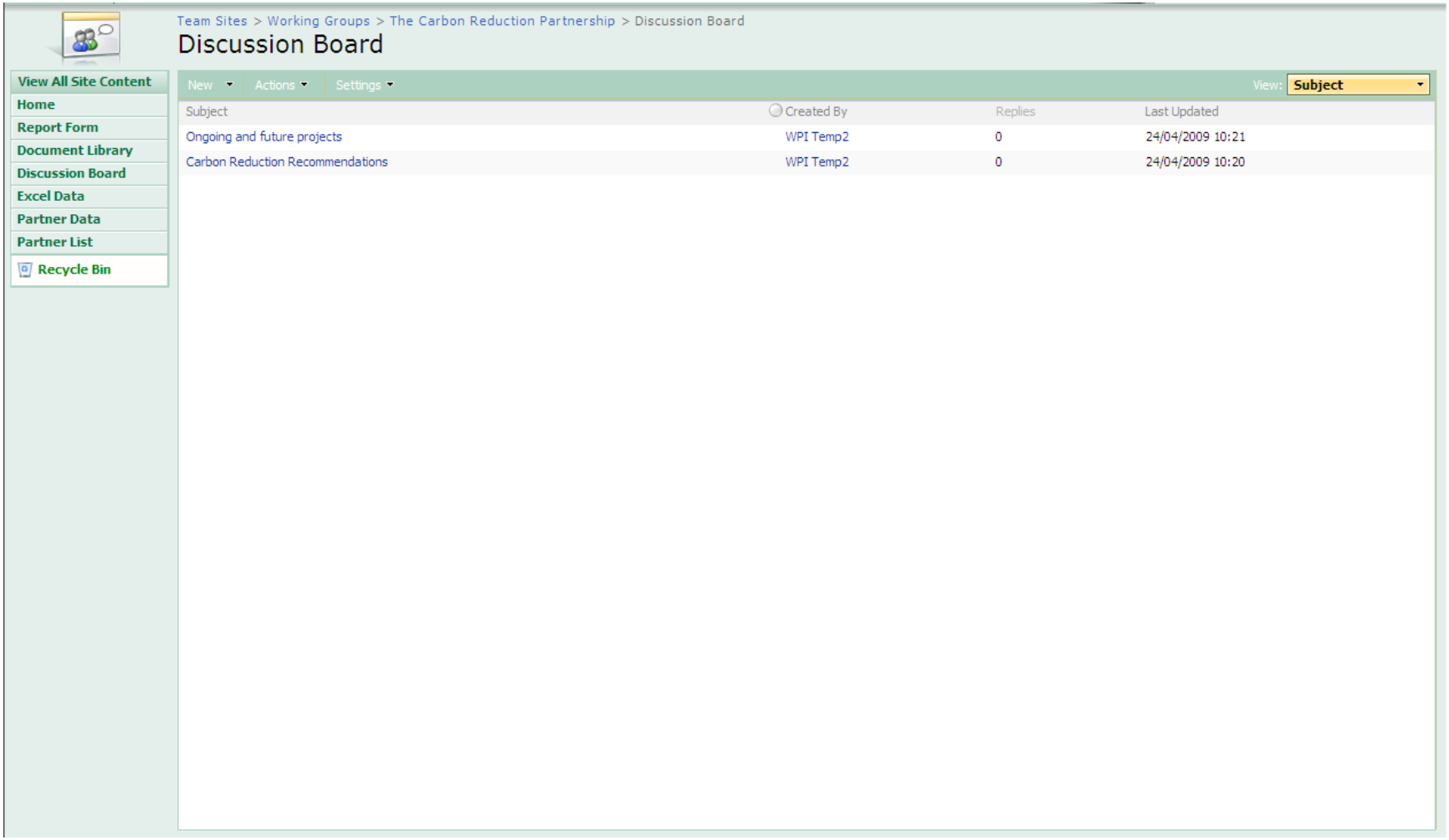


Figure 18: Discussion Board

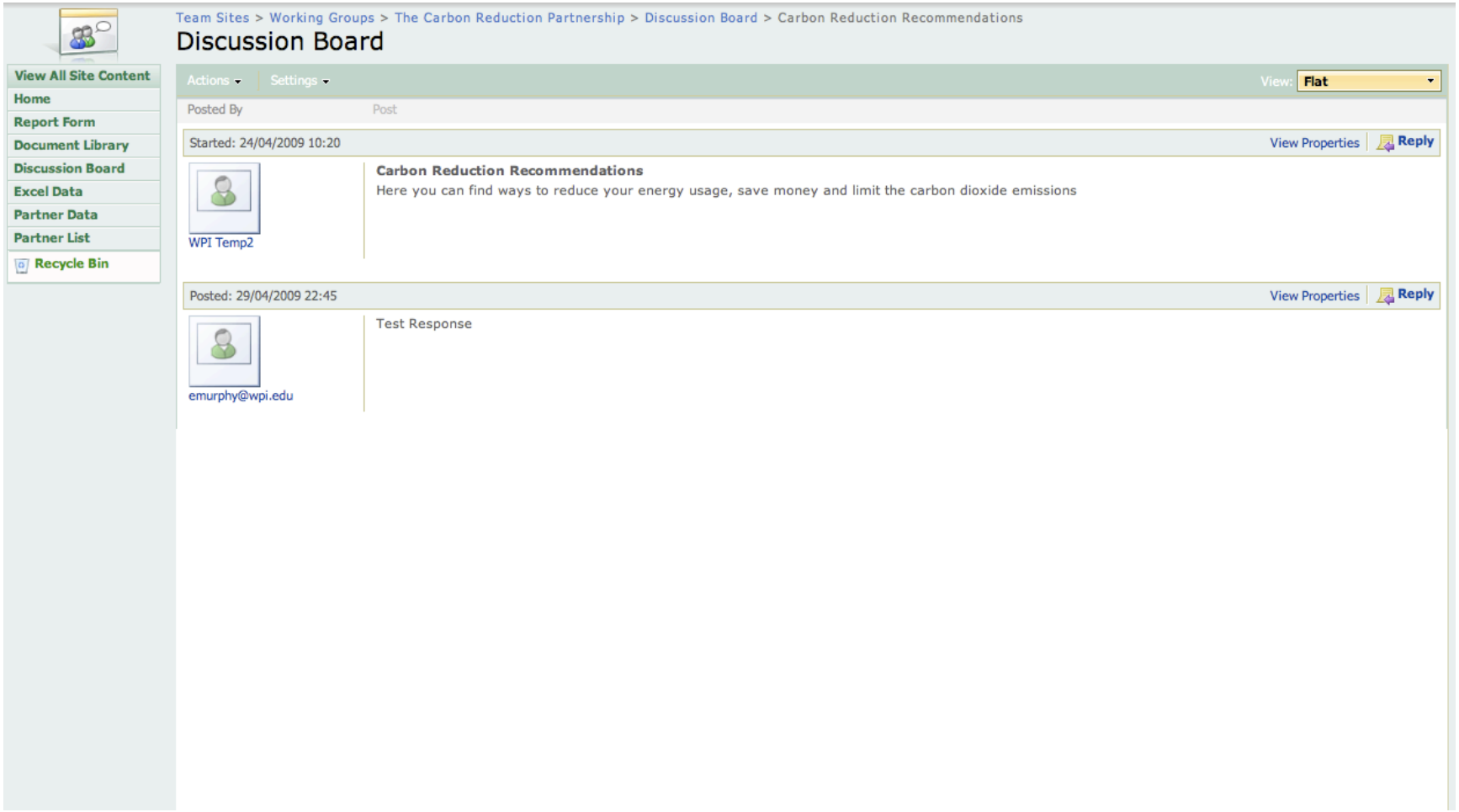


Figure 19: Discussion Thread Example

3.3.7 Web Implementation

The website is a user-driven feature for the partnership. The partners should post topics and replies on the discussion board, as well as input monthly data into the reporting tool. In order to ensure that the goals of the partnership are reached, various sectors of the borough should utilize the tool to aid the CCST officers. Based on discussion with Shadia Rahman, the primary organizer of the partnership, the tool should be used by the core partners, small and medium enterprises (SMEs), and schools. The core partners and SMEs have complete access to the website, including the forum, document library, and reporting form. The schools, however, are restricted to using only the reporting form in order to prevent students from posting to the forum and document library. This will also ensure that students do not view private data that partners do not want public. Carbon emission data is necessary from each sector in order for the CCST officers to get an overall understanding of the carbon emissions throughout the borough. In conjunction with the implementation of the website, the team also deduced other useful recommendations to ensure the success of the Carbon Reduction Partnership.

4 Recommendations

Based on interviews with potential partners, CCST officers, and representatives from other Boroughs, the team offers the following recommendations pertaining to the structure, implementation, and operation of both the partnership and website:

- Offer incentives to draw potential partners
- Use monetary gain to attract partners
- Hold regular meetings
- Create a core steering group of members
- The CCST should set an example by moderating the website
- Employ at least one person whose sole duty is running the partnership
- Stay in contact with the partners through email and telephone
- Expand reporting tool in the future
- Hold regular workshops for the partners

The recommendations are tailored to Kingston's needs, which incorporate the goals and objectives of the LAA and Energy Strategy. These recommendations are a good way to acquire and retain partners, and reach the Borough's carbon reduction goals.

Potential partners will join the partnership if there is an emphasis on lowering energy costs, and will reduce emissions as a byproduct. Provide the monetary gains of saving energy as the selling point for new members. When enterprises invest time in the partnerships and see tangible results indicating the benefits of being a partner, the council can begin to ask for more from the partners.

Free energy saving audits should be offered to small businesses, which often do not have resources to spare on reducing carbon emissions. This is a good incentive for new members, as well. An auditor will go to the place of business and provide a series of recommendations for saving money and reducing emissions. This is free to the partners, takes up minimal time, and will help save money.

The partnership will benefit from the auditing expertise of Go Green and the Carbon Trust, who provide audits for small and large enterprises, respectively. In fact, Go Green has already begun auditing over 100 small businesses throughout the Borough, and is willing to provide carbon emission data to the partnership.

Potential partners expressed interest in meeting only once or twice per year. The discussion board should only act as a supplement to regular meetings. Frequent meetings, on a monthly or quarterly basis, will be the best way to keep partners engaged. Similar partnerships have found the need to meet on a regular basis, as communication by phone and email is not sufficient.

Further, the team recommends identifying a core group of driving partners, typically larger enterprises with the resources to devote to the partnership. The core group should meet every two months at the very minimum, whereas the smaller businesses should be kept engaged through interactive workshops and less frequent meetings.

The council ought to employ at least one member of staff whose sole duty is to run the partnership. The team advises that a member of staff stay in communication with the partners, set up events and workshops, and coordinate with outside resources such as Go Green. In addition, the member of staff should be knowledgeable about current carbon reduction initiatives throughout the Borough.

To engage partners one-on-one, the CCST should directly email, call or meet with each partner. Phone calls and e-mails can be used to remind partners to submit information online, to monitor progress, and to remind them about their carbon reduction commitment. Physically meeting partners emphasizes their importance to the partnership, and is more effective than an email or phone call.

In order to encourage frequent use of the website, regular newsletters should be sent out to the partners via mail and email. The newsletters should provide updates on partnership progress and highlight contributors from both large and small enterprises. The regular emails and newsletters should remind partners about upcoming meetings and workshops.

The team recommends that the CCST officers regularly post new discussion threads on the forum, and ensure that current discussion is based on the goals of the

Carbon Reduction Partnership. The latest documents pertaining to government regulations, policies and best practice carbon reduction methods should also be uploaded to the document library.

As the partnership grows, the reporting tool should be expanded to incorporate more carbon emission data. These expansions may include insulation, types of outlets and light bulbs, floor space, waste, water usage, transportation and other factors that impact energy consumption.

Free workshops should be held regularly in order to educate and encourage interaction between the partners. A topic potentially covered in the workshops includes cost effective carbon reduction techniques. The workshops should be relatively short and scheduled during times most convenient to the partners.

An annual dinner could be held for the entire partnership, where awards are given for carbon reduction achievements. The award acts as an advertising tool for both large and small businesses that meet a certain carbon reduction standard. To encourage the use of the website, the award should be directly based on energy input data.

The Carbon Hub is a reporting and communication website that can be used by environmental partnerships. The Carbon Hub's reporting tool lacks in ease of use because of the complexity of its reporting features. The Carbon Reduction Partnership website, developed by the team and available on the Kingston Council Website, has a simple and easy to use reporting tool. The Carbon Hub costs over £10,000, whereas the CCST officers paid less than £4000 for the Carbon Reduction Partnership website. Table 7 summarizes the pros and cons of each approach.

Carbon Reduction Partnership Website		The Carbon Hub	
Pros	Cons	Pros	Cons
Ease of Use	Not Extensive Reporting Tool	Constantly Updated	Cumbersome layout
Secure login	Attached to Borough's website	Database separate from Borough	Complicated reporting tool
Social Forum	Template similar to Borough's	Highly customizable	Requires training
Simple reporting questions		Thorough reporting tool	Partners need instructions
Instructions and Guidelines		Social forum and Blog	£15000 to £40000 per year
Monthly reporting		Personalized Profiles	
Readable Graphs		Includes an action plan	
List of Recommendations		List of Recommended Actions	
Easy access for CCST			
Updatable by CCST			
£640 to £4000			

Table 7: Comparison with The Carbon Hub

Based on the differences between the two tools, the team recommends:

- Use the Carbon Reduction Partnership website developed by the team in the early stages of the Partnership.
- When the Partnership wishes to expand the reporting tool, consider whether expanding the Carbon Reduction Partnership website's reporting tool or switching to the Carbon Hub is more practical.

With the website and the recommendations supplied by the team, the Carbon Reduction Partnership will flourish and meet the goals set forth by the United Kingdom and the Royal Borough of Kingston.

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Appendix A: Interview Minutes

Meeting with Ed Cotterill

Merton Council
April 1st 2009

- Meeting started at 1100.
- We introduced ourselves and the purpose of our project.
- Ed mentioned that strategic partnerships don't work very well, but he gave us some examples of successful ones in the borough of Richmond or Croyton.
- Then he mentioned that the carbon targets must be met, but the first year of this implementation was 2008, so the data will be available in 2009-2010
- Radu asked Ed if similar environmental initiatives existed in Merton, and Ed said an Environmental Subgroup was formed by the big organizations such as:
    - The Chamber of Commerce
    - The National Trust
    - Other local organizations: Sustainable Merton; Ground Work, etc.
    - He also mentioned that the group doesn't function very well as people are ignoring the advices and topics discussed during the meetings. This is where he mentioned incentives would be a very good idea to spark members' interest.
- Another issue that was discussed was the IT department does not offer much support for the new initiatives of the council.
- This led into a discussion about the website, and how it should be implemented.
- We asked if the Merton Partnership website is used by the members and Ed said he will get back to us on the matter.
- Also, Ed brought up another web-site, CRED.ORG.UK, that offers lots of information regarding what actions organizations should take to reduce carbon emissions.
    - Also the website has pledges that organizations can adhere to, linked to a rough calculation of how much carbon dioxide is reduced if the pledges are followed
    - Another feature of the website involves spin-off sites that get to people through their interest. These can be mini partnerships created by local communities such as churches, football clubs, etc that create awareness among their fans.
        - One example is a Football Club that calculates the CO2 footprint of each game and displays it, such that their supporters can get an idea of their impact.
- Here Ed mentioned Matt Taylor, a person involved with the CRED project.
- The topic of free advice came into discussion, as a way to get the member partners to use the website. Ed said that if we could offer them ways to save

money by reducing their carbon emissions, this would be great: this includes advice, free stuff (seminars, environmental friendly light bulbs, t-shirts, etc)

- Another suggestion from Ed was to create a questionnaire for the future partners from which we could find out what concerns they have, their needs, what they want to change, what worries them at the moment, etc
- Then we discussed carbon reporting, and how that is done
    - Ed mentioned that there is a Carbon Disclosure Project, making all big companies report their data publicly.
    - He mentioned that reporting energy usage is very easy as CO2 footprint can be calculated by applying the formula, but the other sources are harder to estimate: transportation, waste, communication, etc.
- In the end Ed suggested we should give people the tools, show them where they are at the moment and what they could achieve once the use the given tools.
- This linked again into the free stuff for the partners(free seminars, an existing hotline, available advice, etc)
- In this matter Ed talked about Debbie Clement from Croydon Council. She offers support for the businesses in the borough making them work together.
- The meeting adjourned at 1220.

Meeting with Karen Lawrence

Islington Climate Change Partnership
Manager
March 31, 2009
Islington Council Office

Meeting began at 11:00 am

Introduction:

- We introduced ourselves and gave Karen a background on what we are trying to accomplish with our project.
- Karen then informed us that although her office is in the Islington Council, she is in fact working only for the Climate Change Partnership and works along with one other person to manage the partnership. She indicated that the Partnership had a £150k budget from which to work and the fact that they are employed by the partnership makes it feel less Council structured.

Background of the Partnership:

- Karen then indicated that the partnership had been formed 2 years ago and she has only been in her position for three months.
- There is a steering group of 12 to 15 Partners that is made up of the largest emitters. The steering group meets every 1 to 2 months and they currently keep up to date by sharing what they have done and by reinforcing the targets that must be met.

Communications:

- Karen told us that the meetings of the steering group were the only formal communication between members. The majority of the communication is done through emails that are sent out by her.
- The Partnership has an electronic newsletter that is sent out quarterly to the members and is available to the public. Karen indicated that this is not on a set schedule and there has not been one in the time she has been there.
- Karen stated that the Partners do have opportunities to network such as at events like their anniversary event which is held yearly to look at and celebrate monitoring results. There are also workshops that the Partnership provides throughout the year which are focused on large or small organizations and include topics such as green transportation and how to perform your own energy audit.

Website:

- When asked if their website has been used for communications, Karen told us that she had only recently created the website and that is only being trialled with the steering group. She stated that there has not been much communication on the site yet but the members indicated that it would be helpful to be able to share information and learn from others.

- She had looked into creating a site that was hosted by the Council's website but determined that the cost would have been too high. She created the website on the IDEA.com which provides these types of services for free.
- Karen informed us that the website included a chat forum, a calendar of events, a library for things such as case studies, a blog, and a wiki. She believes the blog may be too much work and is not working very well at this point.
- The site should be released to all of the members very soon and as a way to promote usage, Karen plans to place presentations from workshops onto the site and to send out reminders every couple of weeks during the initial stages.
- Karen also stated that there are some people who will never sign up for the site because they may not be very comfortable with the internet or with posting some of their information on this site. She says you must still use emails in order to contact these people and focus your website efforts on those that will use the site.

Reporting:

- The Climate change Partnership reports their monitoring on an annual basis. The Center for Sustainable Energy (CSE) takes all of the information and provides feedback to the Partnership. This service costs £10k per year. The CSE creates a spreadsheet and gets the pertinent information from the partners in order to produce the results.
- The CSE also redraws a baseline for the borough as a whole each year. This is how the Partnership is able to see how their progress is going compared to the rest of the borough and see the impact they need to have.
- When this stage is over, the data for the partnership as a whole is made available and each partner receives their own report and recommendations for improvement.
- Karen then told us that although this data is very valuable, only receiving yearly data can be too slow when working to meet 3 year targets. She said that some of the larger organizations already check theirs every month but if there was a tool available, such as one we may create, that could be used even quarterly then that would be much more helpful to even have a rough idea of how the performance is going.

Closing:

- We then asked if Karen knew of any other boroughs with similar partnerships, she directed us to the Westminster Carbon Alliance which was only created last month, and the Camden Climate Change Alliance who already has a website although it may not be used for communication.
- When asked if it was alright to use her name in the final report, Karen indicated that this would be fine.
- We then thanked Karen for her time and her help and wished her luck in the future.

Meeting with Shadia Rahman

Kingston Council
Climate Change and Sustainable Travel Officer
April 8, 2009

- The meeting started with Shadia discussing the purpose of the partnership. She said this will be a place where everyone can access and fill in data in the community. She said this is a long term goal.
- Next we talked about the data, and its purpose. She said that the council needs accurate local data to support the monitoring of National Indicators 185 and 186 that are required by DEFRA.
- Then we talked about the energy profile.
    - Shadia said that a baseline study of the main buildings was done to assess their energy usage.
    - Then she mentioned there is no street by street data from DEFRA and that is very hard to obtain information from the domestic sector.
    - Next she showed us the breakdown of the CO2 emissions: Domestic, Industrial and Public. She said one of her aims is to break this profile into smaller fields so it will be easier to localize the high emission areas.
- Talking about the website, she said it would be great to implement projects like Smart Metering or Green Streets that could use the aid of a partnership website.
    - She also said that the monitoring tool should set a baseline and then look at monthly energy usage. Based on these data, it can be shown what energy was saved by the projects that were implemented.
    - She mentioned that the baseline data can be reported in kWh, and then converted to CO2 emissions using the DEFRA conversion factors.
    - We also talked about what partners should do to work on the partnership: it involves some time to take the meter readings on a monthly basis and then input them in the website.
- The next topic Shadia brought up was the importance of this project for schools.
    - She said it would be great to set up a framework where school children could input data from the school energy usage.
    - The schools could start an eco team with lesson to read the meters at home and at school and report this data on the website.
    - This also has an educational value, since it teaches the students how to read meters, what it means and also to increase the climate change awareness.
    - To obtain further information about the school, Shadia directed us to Matthew Howard Hughes, the CCST officer that works closely with schools around the borough.
- Going back to the main members of the Strategic Partnership, we talked about Kingston First

    - Shadia said the organization is managing the Business Improvement District in Kingston. Part of these businesses is Bentalls, Eden Walk and John Lewis.
    - Kingston First monitors the economic wellbeing of the area.
- Other big organizations are the voluntary groups, Ethnic or religious.
- The police and the fire brigade have good initiatives but they are hard to reach due to their centralized system.
- Shadia also mentioned that the website could contain a page that would show the organizations and their relation with the council, together with 2 key contacts and the lead officer.
- In the end we talked about how we can attract the members to join the partnership. She said there are two sides: the bigger organizations and the small enterprises.
    - Offering assistance would be a good incentive. Recommendations and forums that would allow the members to interact.
- In the end, Shadia mentioned an action plan to start the partnership.
    - The energy strategy lays an action plan. This leads into the communication aspect. To start, leaflets could be distributed to the stakeholders. From there some initial meetings could be started.
    - A calendar with the meetings and activities could be made available on the website.

Meeting with Helen Clark Bell

Go Green Operations Manager
April 16, 2009
10:00 am

- The interview began with Eric and Jonathan introducing themselves and providing a background on the project.
- It was then asked that Helen provide information on the activities of Go Green.
    - She indicated that they bid to get government grants in order to work with Local Authorities where they work with SME companies (businesses of less than 250 employees)
    - Go Green has been working with those businesses that are on the smaller end of the SME classification and they will work with anyone all the way down to small corner stores.
    - There are four people in Go Green that go out knocking on doors in order to try to get new businesses to work with them. The audits that they conduct look at waste, energy use, travel, and water usage.
    - She stated that these services have quite a large impact on these disadvantaged smaller businesses and put them on "the first rung of the energy ladder."
    - Helen also informed us that Go Green has worked on a project over the past two years with 856 businesses where they looking at their premises, analyzing and providing recommendations of what they can do to reduce their emissions, and giving detailed information of how these steps can save both money and emissions.

- Eric then enquired as to how Go Green tracks changes and savings for these companies.
    - Helen then described how Go Green has created a large number of their own personal spreadsheets that look at everything from how much money and energy can be saved from changing light bulbs, to showing meter readings from certain times during the day to put in perspective just how much energy is being used in one day. She told us that creating these spreadsheets requires a great deal of time and research. This is also difficult because Go Green must go out and get this information from the SMEs.
    - It was shown that this data is not very easy to acquire without having the people available to go out to the businesses. This is because these smaller places do not have the time or resources available to closely examine all of their energy usage.
    - Go Green utilizes a website call Enworks which is a tool that allows for carbon emission information to be reported and tracked for the companies.

    - Helen also mentioned Carbon Hub which has a website that acts as a tool where companies or organizations can track their carbon progress. She stated that Ronan from the Carbon Hub would be a good person to contact.

- Some of the additional findings uncovered during this interview include:
    - Helen had been in contact with Frances Smith, and Go Green had been used by the Royal Borough of Kingston in their past projects. They have worked with well over 100 local Kingston organizations and have already audited and evaluated them. Helen stated she would be happy to release these names for their inclusion in the Partnership.
    - A piece of software is used by some companies called Power Warden. This tool will shut down all computers in a building or put them in sleep mode at a certain time each night. The product can even turn all computers in the middle of the night to perform virus scans or software updates and then shut back down again. Helen stated that the payback period of these tools is very short, often only taking 4-6 months max.
    - Helen advised us that these smaller companies are much more interested in saving money than actually cutting down on their emissions. It is important to find the link between the two and stress the money saving aspect more to them. Helen stated this as "finding the lever" or finding how to get your foot in the door of these companies and stressed that it must be asked what the company wants out of it.
    - When asked about using rewards, Helen thought this was a good idea and that a "carbon neutral" award may be something to get companies to strive for.

- Helen indicated that it would be fine to use her name and Go Green in our report.

Phone Interview with Peter McDonald

The Borough of Croydon
April 16, 2009
12:00 pm

- The interview began with Eric introducing himself and providing background to the project
- It was then asked that Peter provide his experience with the Carbon Hub website
    - The Carbon Hub and Croydon worked together to develop a tool specifically for Croydon's needs.
    - Peter explained that the tool provides confidence for the partners because it is not on the borough's website and it is behind a secure login screen
    - He expressed interest in the tool because of the social networking it creates through forums
    - Peter described that the council has the ability to go onto the website any time and receive an overall report of the borough's emissions
- Eric asked Peter to provide information regarding the data input required of the users
    - He explained that the users have the ability to input a broad range of data, but are only required to input data on energy, water, and waste usage.
    - The users, if the information is available, can also input data regarding transportation within the organization
    - Peter followed by explaining how users are presented with various emission lowering techniques and are asked to create an action plan based on the recommendations
    - The problem with this system is that Peter found it difficult to find the carbon champion within each organization to input the data
- Eric inquired about companies that currently use the tool and any useful contacts that Peter could offer
    - Peter supplied the name Bruce Halai-Carter from First Impressions Last Longer.
- Eric asked how much a tool such as the Carbon Hub costs
    - Peter responded that the tool costs Croydon about 10,000 pounds per year
    - He followed up that there are free calculators available, such as Act on CO_2 that may suffice
    - He finished by saying that the Carbon Hub is very customizable to the needs of each individual as well as the council's needs
- Peter indicated that it would be acceptable to use his name and the Borough of Croydon in the report

Meeting with Lucinda Raggett

Kingston First Operations Manager
April 20, 2009
2:00 pm

- The meeting began with Eric and Jon providing background on the project and the formation of the Carbon Reduction Partnership.
- Lucinda then described that Kingston First works for businesses in the borough and is funded by the businesses paying 1% extra on top of their council tax.
    - They provide some of the basic needs of the businesses and work to increase the number of people that visit them.
    - This includes street cleaning, adding chairs outside of their buildings, providing a cardboard recycling service, and keeping the streets clean.
    - She also indicated that Kingston First often acts as a link between the council and the businesses.
- It was then asked if Kingston First would be a good resource in the formation of the partnership and Lucinda indicated that they would be able to fit into such a role.
    - She stated that many of the larger businesses would be likely to show interest in such a partnership as many of them already have personal energy policies and have to report to themselves.
    - Lucinda said that enlisting smaller businesses would be a much more difficult task. It was her opinion that the money saving benefits must be clear but even then many of these people find it to be fluff. She also stated that someone must go out and see these people in order to get them to act.
- When asked about how Kingston First communicates and stays in contact with all of the businesses they work for, Lucinda said that the primary means are through phone calls, email, face-to-face interaction, and through a newsletter.
    - She indicated that long letters are not very effective and many times are thrown out.
    - There are groups that meet every 6 weeks and there is a stakeholders meeting on the first Friday of each month. These are very useful forums.

Minutes from meeting with Simon Evans

Director of the Carbon Alliance in Westminster
April 16, 2009
10:00 am

- Introduced ourselves, explained the project and the creation of the Carbon Reduction Partnership
- He explained that he worked at the Greater London Authority, running the partnership over there together with two other people
    - Need at least one person to run the partnership full-time
- We asked when the Westminster partnership was created.
    - The Westminster Carbon Alliance was started last year but it was actually implemented in February 2009
    - The leader of the council set a reduction goal of 20.12% by 2012, creating a need for this partnership
- Regarding the functioning of the Alliance, Mr Evans specified that it is split into different working groups. Different groups of the Alliance are Public Agencies, Central Government Buildings, three Business Improvement Districts (BIDs) such as New West End Committee, Housing Associations, the religious organization FAITH, and the Voluntary sector.
    - A representative from each working group makes up the steering group.
        - The partners in their group report to them, then they report to Mr. Evans
- The first formal meeting with the working groups will be on 31 April
- Simon obtained funding from the European Union to begin auditing the members of the 3 BIDs together with the public agencies
    - Discussing the auditing, he said it is very beneficial for the audited organizations and businesses because it provides them with ways to save energy and money
- Another topic discussed with the monitoring aspect is that Simon wants to implement a reporting form in which to insert the building details, address, location, and energy usage, for each building of the members of the association.
    - Online reporting spreadsheet
- The District Heating Network can offer specific information of the energy usage.
    - Attempting to restructure distribution of heating (gas)
- Another topic was the Voluntary Sector, and the Voluntary Action Organization. These are easy to get to, as they are very involved in Environmental Initiatives.
- With regards to the Carbon Reduction Commitment (CRC), businesses will be very interested in using a tool like this that would provide a lot of

information on implementing carbon reduction projects, since they must commit to the CRC.

- Discussing means of communication, the best way to get people involved is to have informal events to present new projects and initiatives and to offer to help and support those who want to do the projects.
    - Involvement from someone within the council is necessary in order to keep contact with the partners.
        - Need at least one full-time employee
    - Communication can take place only within partners pursuing the same project. This way everyone will be involved at some point, but not all the time.
    - Meetings with each working group every three month would be the best way, but this will involve keeping contact with them through e-mail, meetings and presentations in between.
    - He specified the informal events help the chat among organizations creating a good framework for developing projects and initiatives.
- We asked him how to attract the partners in the partnership and how to get them communicate:
    - The most important thing was the free audits that they can benefit from, as well as the commitment that they must adhere to when joining. Also, he said that some of them are already involved in environmental activities and would take this as an opportunity to improve.
- Simon mentioned his work with the London Energy Partnership. This was started earlier, and he was keeping contact with the working groups.
    - The partnership had a steering group that would coordinate the activity, but different members implemented separate projects.
    - Also, ad-hoc groups were created, and a chair was nominated in each group.
- Another example was the Energy Efficiency Partnership for Homes. They also have working groups, and they provide a newsletter, communicating the newest actions of the partnership.
- Then we talked more about the reporting form. He mentioned that the Public Agencies must report on it. In general it is important to distinguish between what is needed and what is optional to be reported.
- In the end we discussed maintaining contact with the partners.
    - He suggested trying to identify a care group for the partnership. Also, the partners need to meet, and they would have to use the website to report their data.
    - Optimizing the e-mail communication was another important aspect, as this shouldn't be spam, but should inform and raise interest.
    - It was concluded that someone within the council will have to maintain the partnership connections, and he also mentioned that each member commitment is very important for implementing projects.
- There is no substitute for human interaction

    - "Green Cinemas"/Presentation
        - Speakers
        - Informal Chat
            - Especially important for SMC's
- The interview ended with a short discussion about topics of various workshops that can be organized. He mentioned that presentation about groundbreaking projects conducted by some of the members could be shared with the others, such that would generate involvement.

Minutes from meeting with Kingston University

Wayne Hitchings – Energy Manager
Nicola Corrigan – Sustainability Facilitator
Elise Toogood
04/21/2009
11:00 a.m.

- The interview started with a description of the group's project and a description of the Carbon Reduction Partnership.
- Nicola described the position of the University with regards to the environment and sustainability.
    - Kingston University is part of the Carbon Trust for Universities and that they are in their first year of the implementation plan.
    - The university just developed a baseline for carbon emissions by looking at the energy, water, waste and other factors, including as the new buildings
- Wayne talked about projects for better monitoring the student housing and the insulation of university buildings.
- Nicola talked about a loan application to Selix Finance for sustainable projects.
- Wayne talked about a project installing smart meters and sub meters (electronic meters that attach to mechanical meters), devices that would centralize the energy usage information and it would be easier to obtain.
- Nicola mentioned that the University would not benefit very much from using the website and from the Reduction Partnership because it is already working with the Carbon Trust on several projects, and is farther along than the council. However, she said that they would like to be part of the partnership and to offer their expertise to other partners as a Case Study.
- She spoke further about the Carbon Trust, saying that they offer free survey's for SME's, which the council should look into.
- Face to face interaction is very important and the university was assigned a project manager from the Carbon Trust that would contact them every two weeks on the progress of programs and to remind them what of the next steps.
- It was suggested that the partnership ask for information about the machinery that some SME's are using and, based on that, to look for projects that will minimize the usage of energy.
- The university is obliged to track their transportation. They do this through bi-annual travel surveys and also by assessing the business travel.
    - The university is committed to a national standard to reduce student travel.
        - Ie: more buses, more localization of the types of classes campuses offer that students are taking with respect to the campus they live on.

- Wayne talked about other networks they are using and the communication among them. He said that the Environmental Association of Universities and Colleges communicates very often via e-mail. He also said that within the networks, energy efficiency projects are discussed and other resources are shared.
- Nicola hinted again towards the Carbon Trust. She said that it benefits from government funding, allowing them to provide audits and to help implement projects with organizations.
- Most public buildings need to display the Energy Performance Certificate.
- Nicola said again that the University would be happy to offer their expertise and knowledge to the partnership and even help the council with other projects.

Appendix B: Comparison Matrix

		Karen Lawrence	Ed Cotterill	Go Green	The Carbon Hub	Shadia Rahman	Matthew Howard-Hughes	Carlos Queremel	ICT and Parabola	Ease of Use	Understandability	Functionality	Conclusion
Communication Tools:	Forum	o		o	o	o			o	Easy to read and update by a variety of users	Widely useable with training or instructions	Encourages Discussion	Implemented
	Blog	X		o	o				o	Easy to read, but very difficult to update	Requires Instruction and regular updates	Very Linear, not discussion based	
	Group Emails	o	o	o	o		o		o	Form most commonly used	Most recognizeable by all users	Discussion Based, Widely Available	Implemented
	Wiki								o	Not easy to update by the masses	Similar to an encyclopedia and very understandable	No discussion, Users only Edit Informative Articles	
	Instant Messaging								X	Requires training or instructions to use properly	Straightforward to understand flow of discussion	Only usable with Scheduled meetings	

		Karen Lawrence	Ed Cotterill	Go Green	The Carbon Hub	Shadia Rahman	Matthew Howard-Hughes	Carlos Queremel	ICT and Parabola	Conclusion
Website Development:	Login Screen	o	o	o	o	o	o		o	Implemented
	Presentable Data			o	o		X		o	Implemented
	Presentable Graphs				o		o		o	Implemented
	Document Library	o				o			o	Implemented
	List of Recommendations				o			o	o	Implemented

Figure 20: Communication and Web Development Matrix

Appendix C: DEFRA Conversion Factors

Emission factors

Energy type	Factor (kg CO_2/kWh gross)	Reference
Electricity (grid)	0.523	http://www.defra.gov.uk/environment/business/envrp/pdf/conversion-factors.pdf - Annex 3
Electricity - CHP	0.295	http://www.defra.gov.uk/environment/business/envrp/pdf/conversion-factors.pdf - Annex 3
Electricity (onsite renewables)	0.000	
Natural gas	0.185	http://www.defra.gov.uk/environment/business/envrp/pdf/conversion-factors.pdf - Annex 1
Gas oil	0.251	http://www.defra.gov.uk/environment/business/envrp/pdf/conversion-factors.pdf - Annex 1
Burning oil	0.245	http://www.defra.gov.uk/environment/business/envrp/pdf/conversion-factors.pdf - Annex 1
LPG	0.214	http://www.defra.gov.uk/environment/business/envrp/pdf/conversion-factors.pdf - Annex 1
Wood	0.000	http://www.ipcc-nggip.iges.or.jp/public/gp/english/2_Energy.pdf
Coal	0.329	http://www.defra.gov.uk/environment/business/envrp/pdf/conversion-factors.pdf - Annex 1

Figure 21: NI186 Conversion Factors

Appendix D: Reporting Form Spreadsheets

Electricty Meter Data

	Partner A	Partner B	Partner C	Partner D
Jan	15000	54325	964665	123141
Feb	16000	54254	542764	431223
Mar	14000	56426	76357	431213
Apr	13000	5454	876486	132143
May	12000	6543	854456	122454
Jun	11000	67373	876458	543267
Jul	10000	64262	564527	642354
Aug	9000	65414	542356	653452
Sep	8000	76421	653466	532431
Oct	10000	54254	653473	312323
Nov	9000	87535	653655	412234
Dec	8000	54315	542143	112344

CO_2 Emission Data

	Partner A	Partner B	Partner C	Partner D
Jan	7845	28411.975	504519.795	64402.743
Feb	8368	28374.842	283865.572	225529.629
Mar	7322	29510.798	39934.711	225524.399
Apr	6799	2852.442	458402.178	69110.789
May	6276	3421.989	446880.488	64043.442
Jun	5753	35236.079	458387.534	284128.641
Jul	5230	33609.026	295247.621	335951.142
Aug	4707	34211.522	283652.188	341755.396
Sep	4184	39968.183	341762.718	278461.413
Oct	5230	28374.842	341766.379	163344.929
Nov	4707	45780.805	341861.565	215598.382
Dec	4184	28406.745	283540.789	58755.912

Total	Baseline
605179.513	575000
546138.043	585000
302291.908	595000
537164.409	605000
520621.919	615000
783505.254	625000
670037.789	635000
664326.106	645000
664376.314	655000
538716.15	665000
607947.752	675000
374887.446	685000

Figure 22: Electric Meter Reading

Heat Meter Data

	Partner A		Partner B		Partner C		Partner D	
	Heat Type	Meter Reading	Heat Type	Meter Reading	Heat Type	Meter Reading	Heat Type	Meter Reading
Jan	Gas Oil	150000	Burning Oil	150000	Coal	150000	LPG	150000
Feb	Gas Oil	140000	Burning Oil	140000	Coal	140000	LPG	140000
Mar	Gas Oil	130000	Burning Oil	130000	Coal	130000	LPG	130000
Apr	Gas Oil	120000	Burning Oil	120000	Coal	120000	LPG	120000
May	Gas Oil	110000	Burning Oil	110000	Coal	110000	LPG	110000
Jun	Gas Oil	100000	Burning Oil	100000	Coal	100000	LPG	100000
Jul	Gas Oil	90000	Wood	90000	Coal	90000	LPG	90000
Aug	Gas Oil	80000	Wood	80000	Coal	80000	LPG	80000
Sep	Gas Oil	70000	Wood	70000	Coal	70000	LPG	70000
Oct	Natural Gas	90000	Wood	90000	Coal	90000	LPG	90000
Nov	Natural Gas	80000	Wood	80000	Coal	80000	LPG	80000
Dec	Natural Gas	70000	Wood	70000	Coal	70000	LPG	70000

CO_2 Emission Data

	Partner A	Partner B	Partner C	Partner D
Jan	37650	36750	49350	32100
Feb	35140	34300	46060	29960
Mar	32630	31850	42770	27820
Apr	30120	29400	39480	25680
May	27610	26950	36190	23540
Jun	25100	24500	32900	21400
Jul	22590	0	29610	19260
Aug	20080	0	26320	17120
Sep	17570	0	23030	14980
Oct	16650	0	29610	19260
Nov	14800	0	26320	17120
Dec	12950	0	23030	14980

Total
155850
145460
135070
124680
114290
103900
71460
63520
55580
65520
58240
50960

Figure 23: Heat Meter Data